375 Field Communicator User's Manual

375
FIELD COMMUNICATOR

USER'S MANUAL

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375 FIELD COMMUNICATOR

NOTICE

Read this User's Manual before working with the 375 Field Communicator. For personal and system safety, and for optimum product performance, thoroughly understand the contents before using or servicing this product.

For equipment service needs, contact the nearest product representative.

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SECTION 1 INTRODUCTION

USING THIS MANUAL

The sections in this manual provide the following information on the 375 Field Communicator.

Section 2: Learning the Basics contains information on settings, types of storage, IrDA® communication, card readers, ScratchPad, maintenance, and managing files and storage.

Section 3: HART Functionality contains information on starting the HART® application, establishing communication with connected HART devices, and configuring the HART application.

Section 4: Fieldbus Functionality contains information on starting the Fieldbus application, establishing communication with connected fieldbus devices, viewing the Live Device List, block lists, and configuring the Fieldbus application.

Section 5: Troubleshooting provides solutions to the most common 375 Field Communicator operating problems.

Appendix A: Reference Information provides physical, functional, and performance specifications.

Appendix B: Product Certifications contains Hazardous Location Certifications, European directive information, and approval drawings.

Appendix C: Graphics Information contains an overview of the Graphics functionality and screen options in the 375 Field Communicator.

SECTION 2 LEARNING THE BASICS

OVERVIEW

This section provides instructions on basic features and functions of the 375 Field Communicator. It also provides information on starting, entering stand by, shutting down, configuring, using the ScratchPad application, and maintaining the 375 Field Communicator. The functionality described in this section is based on system software version 2.0.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol. See the Troubleshooting section for more warning messages.

⚠ IMPORTANT NOTICE

Ensure the battery pack and the 375 Field Communicator are properly aligned during assembly to prevent damage to the connector pins.

⚠ IMPORTANT NOTICE

Do not pull up on the battery pack as this could damage the power supply connector. The System Card must be inserted or removed by applying gentle pressure in line with the axis of the card and the socket. Do not pull upwards or press downwards on the card as this could damage the card or the unit and void the warranty.

⚠ WARNING

A Re-Flash operation initiates the reinstallation of the firmware and software from the System Card. This should only be performed under the direction of technical support personnel.

⚠ WARNING

Using Windows Explorer and a card reader to transfer files between the System Card and a PC can corrupt the System Card. This operation should only be performed under the direction of technical support personnel.

⚠ WARNING

The touch screen should be contacted by blunt items only, preferably the stylus included with the 375 Field Communicator. Using sharp instruments, such as screwdrivers, can cause failure of the touch-screen interface and void the warranty. Repair of the touch screen requires replacement of the entire 375 Field Communicator display assembly, which is possible only at an authorized service center.

PRODUCT OVERVIEW AND PRECAUTIONS

The 375 Field Communicator, when labeled, is an industrial handheld communicator approved for use in hazardous locations classified as Zone 0 (FM and CSA only), Zone 1, or Zone 2, Division 1 and Division 2. The fieldbus segment, to which the 375 Field Communicator is connected, is allowed to go through Zone 0, 1, 2 and Zones 20, 21, 22, Division 1 and Division 2.

The 375 Field Communicator supports HART and FOUNDATION fieldbus devices, allowing the user to configure or troubleshoot in the field. When using the 375 Field Communicator to communicate with devices, all standards and procedures applicable to the location should be followed. Failure to comply may result in equipment damage and/or personal injury. Be sure to understand and comply with the following items:

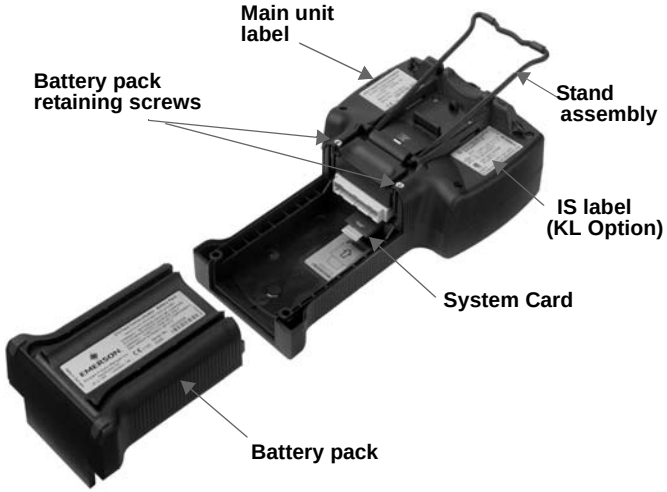
- The portable 375 Field Communicator includes an FSTN type LCD with touch-screen, an NiMH battery pack, an SH3 processor, memory components, and integral communication and measurement circuitry.
- An IS-approved 375 Field Communicator can be used in Zone 0 (FM and CSA only), Zone 1, or Zone 2, Division 1 and Division 2 locations (KL option only).
- An IS-approved 375 Field Communicator may be connected to loops or segments that are attached to equipment located in Zone 0, Zone 1, Zone 2, Zone 20, Zone 21, Zone 22, Division 1 and Division 2 (KL option only).

- The touch screen must be contacted using blunt items only, preferably the stylus provided by the factory. Using sharp instruments, such as screwdrivers, can cause failure of the touch-screen interface and void the warranty. Repair of the touch screen requires replacement of the entire 375 Field Communicator display assembly, which is possible only at an authorized service center.
- There are three terminals on the top of the unit. Two are red and one is black. Each red terminal is a positive connection for its protocol, while the black terminal is a common terminal shared by both protocols. An access door ensures only one pair of terminals is exposed at any one time. Several markings indicate which pair of terminals is for which protocol.
- When connecting the 375 Field Communicator to an active FOUNDATION fieldbus segment, ensure there is adequate spare current capacity to power the 375 fieldbus circuits. The 375 Field Communicator draws approximately 17 mA.
- The infrared port and card reader provide methods for the 375 Field Communicator to interface with a PC.
- Data is input into the 375 Field Communicator via the keypad or touch-screen interface.
- An Expansion Module (EM) (labeled Expansion Module) is a removable memory card that snaps into the Expansion Port. Removal and installation of an EM is allowed in a hazardous area.
- Only the Expansion Module or Expansion Port Plug should be inserted into the Expansion Port. System Cards/Secure Digital cards or other objects must not be put into the Expansion Port. Failure to comply will void the IS approval and the warranty.
- The Secure Digital cards used in the System Port must be those supplied by the 375 Field Communicator manufacturer. Failure to comply will void the IS approval and the warranty.
- Removal and installation of the battery pack in a hazardous area is allowed.
- The battery pack must not be charged in hazardous area environments.
- The battery pack may only be charged with the 375 Field Communicator power supply/charger. Failure to comply may permanently damage your 375 Field Communicator and will void the IS approval and the warranty.
- The power supply/charger should be safeguarded from moisture. Operating and storage temperature limits should be respected.
- The power supply/charger should not be covered, subjected to direct light, or placed upon or next to heat-sensitive materials.
- Do not open or modify the power supply/charger. There are no user-serviceable components or safety elements inside. Opening or modifying the power supply/charger will nullify the guarantee and the warranty.
- Use the power supply/charger with the 375 Field Communicator only.

INSTALLING THE SYSTEM CARD AND THE BATTERY PACK

1. Place the 375 Field Communicator face down on a level, secure surface; see Figure 2-1.
2. Lock the stand into the hanger position. To pivot past the stand position, squeeze the stand together near the hinge.

Figure 2-1. Back side of the 375 Field Communicator



3. With the battery pack removed, place the System Card, with the card contacts facing up, on the main unit System Card guide ribs (located directly below the battery pack connector). Insert the System Card until it is firmly in place.
4. With the main unit still face down, ensure the tops of the two battery pack retaining screws are flush with the top of the battery pack.
5. Install the battery pack by aligning the sides of the battery pack and main unit and carefully sliding the battery pack forward until it is secure. If the battery pack and main unit are not properly aligned, the connector pins can be damaged.

⚠

6. Tighten the two battery pack retaining screws until they are secure (do not overtighten). The tops of the screws should now be close to flush with the stand groove.

STARTING UP AND SHUTTING DOWN

Prior to using the 375 Field Communicator without the charger/power supply, fully charge the battery pack. A full charge is indicated by a solid green light on the charger/power supply. Charging may take up to two hours, but the 375 Field Communicator may be used while charging. Before operating the 375 Field Communicator, ensure:

- The 375 Field Communicator is not damaged.
- The battery pack is fully seated.
- All screws are sufficiently tightened.
- An Expansion Module (EM) or Expansion Port Plug is in place.
- The communication terminal recess is free of dirt and debris.

Starting the 375 Field Communicator

Press and hold the on/off/stand by key until the multifunction LED flashes to indicate the unit is powering (approximately two seconds). See Figure 2-2 for the location of the on/off/stand by key.

During start-up, the 375 Field Communicator will automatically install any software upgrades available on the System Card. Once the upgrade is complete, the 375 Main Menu will be displayed. After starting the 375 Field Communicator, you can:

- Launch the HART or FOUNDATION fieldbus applications (if licensed)
- Configure/view settings
- Enter Listen For PC mode
- Launch the ScratchPad application

Entering Stand By

The 375 Field Communicator can be put into stand by, which turns off the display and certain areas within the 375 Field Communicator. Use this option to save battery life or to reduce the boot-up time if you will be using the 375 Field Communicator intermittently.

You can put the 375 Field Communicator in stand by when the HART application or the Fieldbus application is running. If you are working online with a HART or fieldbus device when stand by is entered, the application main menu will be displayed when the 375 Field Communicator returns from stand by. Otherwise, the 375 Field Communicator will display the screen that was open when stand by was entered.

To enter stand by, press the on/off/stand by key. From the Power Switch dialog box, tap **Stand by** and tap **OK** or press the enter key. Tap **Cancel** to close the dialog box and return to the application. The multifunction LED will slowly flash a green light when the 375 Field Communicator is in stand by. To leave stand by, press the on/off/stand by key.

The 375 Field Communicator will also enter stand by if the stand by timer has expired. See “Power Status” on page 2-14 for more information.

Shutting Down the 375 Field Communicator

To shut down the 375 Field Communicator, press the on/off/stand by key. From the Power Switch dialog box, tap **Shut down** and tap **OK** or press the enter key. Tap **Cancel** to close the dialog box and return to the application.

You can also shut down the 375 Field Communicator by simultaneously pressing the backlight adjustment key and the function key until the display turns off. This is a mechanism by which the shut down is accomplished in the hardware (similar to removing the power to a PC using a switch). This is not the recommended way of shutting off the 375 Field Communicator.

The 375 Field Communicator will also shut down if the auto-off timer has expired. See “Power Status” on page 2-14 for more information.

BASIC FEATURES AND FUNCTIONS

Figure 2-2. 375 Field Communicator diagram

Using the Keypad

The 375 Field Communicator keypad and touch screen have nearly total functional redundancy.

On/Off/Stand By key

The on/off/stand by key ( ) is used to power on and off the 375 Field Communicator or to put it in stand by. If the on/off/stand by key is pressed when there is unsent data or a device method is running, a warning message will appear. Tap **OK** to have the 375 Field Communicator enter stand by or shut down, or tap **Cancel** to return to the previous screen.

The on/off/stand by key is disabled when the 375 Field Communicator is in Listen For PC mode or when the ScratchPad application is open.

Arrow Navigation keys

Four arrow navigation keys let you move through the menu structure of the applications. Press the right arrow key ( ) to select menu items and to navigate further into the menu.

Enter key

The enter key ( ) lets you select the focused (highlighted) item or to complete an editing action. For example, if you push the enter key when the **Cancel** button on a screen is in focus, you will cancel out of that screen.

The enter key does not allow you to navigate through the menu structure. Use the arrow navigation keys or the stylus to select menu items and to navigate through the menu structures.

Tab key

The tab key ( ) lets you move between selectable controls.

Alphanumeric keypad

The alphanumeric keypad lets you select letters, digits, and other characters, such as punctuation marks. It can perform a selection of options and data entry in either numeric or alphanumeric modes. The 375 Field Communicator will automatically determine the mode depending upon the input necessary for the particular field.

To enter text when in alphanumeric mode, press the desired keypad button in quick repetition to scroll through the options to achieve the appropriate letter or number. For example, to type the letter Z, press the 9 key quickly four times; see Figure 2-3.

Figure 2-3. Keypad button functionality example

Backlight Adjustment key

The backlight adjustment key ( ) lets you adjust the intensity of the display. There are four different settings. The intensity impacts the battery life of the 375 Field Communicator. Expect a shorter battery life for higher intensities; see “Backlight” on page 2-12 for the settings.

Function key

The function key ( ) lets you enable alternate functionality on select keys. The grey characters on the keys indicate the alternate functionality. When the function key is enabled, the orange multifunction LED light will appear and an indication button can be found on the Soft Input Panel (SIP). Press the function key again to disable the functionality.

The alternate function on the Tab and alphanumeric 5 key (insert) will be activated in future releases of the 375 Field Communicator software.

Multifunction LED

The multifunction LED lets you recognize when the 375 Field Communicator is in various states; see Table 2-1.

Table 2-1. Multifunction LED

Multifunction LED	Processing indication
Solid green	The 375 Field Communicator is on.
Flashing green	The 375 Field Communicator is in power saving mode (stand by). The display is off.
Solid green and orange	The function key is enabled.
Blink green and orange	The on/off/stand by key has been held down long enough for power up.

Using the Touch Screen

The touch screen display lets you select and enter text by touching the window. Tap the window once to select a menu item or to activate a control. Double-tap to move further into the menu level.

NOTE
All instructions in this manual are written for the touch screen.

⚠ The touch screen should be contacted by blunt items only, preferably the stylus included with the 375 Field Communicator. Using sharp instruments, such as screwdrivers, can cause failure of the touch-screen interface. Repair of the touch screen requires replacement of the entire 375 Field Communicator display assembly, which is possible only at an authorized service center.

Use the back arrow icon (🡐) to return to the previous menu. Use the terminate icon (✕) in the upper right corner of the touch screen to end the application.

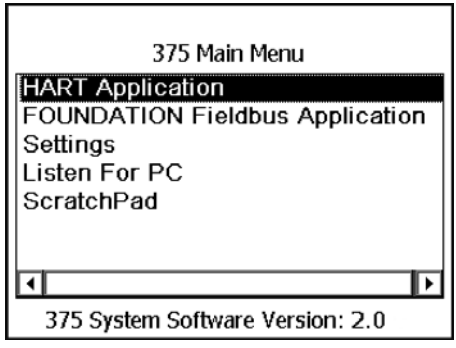
Use the Soft Input Panel (SIP) keyboard

The SIP keyboard allows for alphanumeric input using the touch screen. The SIP keyboard detects when you need to enter characters and will appear automatically as required.

THE 375 MAIN MENU

The 375 Main Menu lets you run the HART application, run the FOUNDATION Fieldbus application, run the Settings menu, communicate with a PC, and launch the ScratchPad application.

Figure 2-4. 375 Main Menu example



Starting the HART application

From the 375 Main Menu, double-tap **HART Application** to run the HART application. On startup, the HART application will automatically poll for devices.

Starting the Fieldbus application

From the 375 Main Menu, double-tap **FOUNDATION Fieldbus Application** to run the Fieldbus application.

Running the Settings menu

From the 375 Main Menu, double-tap **Settings** to view the Settings menu. The Settings menu lets you set preferences for the 375 Field Communicator and view system properties and license information.

About 375

About 375 lets you view the software property revisions of your 375 Field Communicator. If you need to call technical support personnel, have the system software version, Communication and Diagnostic Circuitry (CDC) version, and the operating system version on hand.

⚠ Launching RE-FLASH initiates the reinstallation of the firmware and software from the System Card. The 375 Field Communicator must be running on external power when the RE-FLASH operation is performed. During the operation, the stand by and auto-off timers will be disabled. This operation should only be performed under the direction of technical support personnel.

Launching RE-IMAGE will re-install the operating system, system software, and applications on your 375 Field Communicator. The 375 Field Communicator must be running on external power when the RE-IMAGE operation is performed. During the operation, the stand by and auto-off timers will be disabled. This operation should only be performed under the direction of technical support personnel.

Tap **OK** to return to the Settings menu.

Backlight

The backlight setting lets you adjust the intensity of the display. To adjust the backlight, drag the slider left to right.

The backlight setting also lets you set timers to automatically turn off the backlight after a specified period of inactivity. These timers apply when the 375 is running on battery power or external power. Turning off the backlight after periods of inactivity will save battery power. To enable a timer, click a drop-down menu and select the appropriate time interval.

When you have selected the appropriate backlight settings, tap **OK** to retain this setting for this session only, **SET DEFAULT** to retain this setting upon start up, or **CANCEL** to exit without changes.

Clock

The clock setting lets you set the date and time on the 375 Field Communicator. Configure the date by using the drop-down menu. To configure the time, highlight the appropriate time field and use the arrows to scroll through values until you find the correct time. Select **OK** to save the changes and to close the window, or **CANCEL** to exit without changes.

Contrast

The contrast setting lets you adjust the lightest and darkest areas on a display screen.

To adjust the contrast, drag the slider to the left or right. The window will automatically adjust the contrast as you move the slider. When you find an appropriate contrast setting, tap **OK** to retain this setting for this session only, **SET DEFAULT** to retain this setting upon start up, or **CANCEL** to exit without changes.

NOTE
Temperature can affect contrast.

License

The license setting lets you view the enabled licenses on the System Card. The HART application license is standard in every 375 Field Communicator. Other licenses available include the FOUNDATION fieldbus application, Easy Upgrade option, and the Graphics option. Unlicensed features cannot be accessed.

The License screen also displays the System Card Serial Number (SN) and the unit name of the 375 Field Communicator. A unit name can be assigned by using the Easy Upgrade Programming Utility. See the Programming Utility online Help for more details. Tap **OK** to return to the Settings menu.

Memory

The memory setting lets you view available free space in the System Card, Internal Flash, RAM, and Expansion Module (if installed).

Power Status

The power status setting lets you specify power management options for when the 375 Field Communicator is running on battery power. To specify values for the stand by or auto-off timers, select the time intervals from the drop-down menus. After the specified periods of inactivity, the stand by timer will put the 375 Field Communicator in stand by mode, or the auto-off timer will turn off the 375 Field Communicator. If set to short intervals, these timers will save battery power.

The Maximize Power Savings option conserves additional battery power by allowing the 375 Field Communicator to enter stand by mode or shut down when communicating with a device. To enable Maximize Power Savings, tap the checkbox and a checkmark appears. If this option is disabled, the 375 Field Communicator will not enter stand by or shut down when communicating with a device.

The Maximize Power Savings option applies only when the 375 Field Communicator is communicating with a device. If it is not communicating with a device, the 375 Field Communicator will enter stand by or shut down when the timer expires, independent of the Maximize Power Savings option. This can occur when viewing certain menus, such as the Settings menu or an application main menu.

When you determine the appropriate power management settings, tap **OK** to apply the settings for this session only, **SET DEFAULT** to retain the settings upon start up, or **CANCEL** to exit without changes.

Retrain the Battery

The retrain the battery setting lets you fully discharge the battery so it can be charged to its full capacity. Perform this operation if you notice a decrease in battery life or every three to six months as a best practice. Ensure the 375 Field Communicator is running on battery power when this operation is performed.

During the operation, a message will be displayed and the backlight will be set to its brightest setting to quickly discharge the battery. The backlight, stand by, and auto-off timers will be disabled. It may take up to several hours to discharge the battery, depending on the amount of battery power that remained when the operation began.

If you tap **CANCEL**, the battery will stop discharging and the backlight, stand by, and auto-off timers will be re-enabled. The backlight setting will also be restored.

After the battery is fully discharged, do not use the 375 Field Communicator on battery power until it has been recharged to its full capacity. However, you can use the 375 Field Communicator while it is being charged.

Touch Screen Alignment

The touch screen alignment setting lets you calibrate the touch screen with the display. Tap the cross hairs firmly and accurately at each location on the window. The target will continue to move until the touch screen is aligned. Touch screen alignment will be retained upon start up.

Event Capture

The event capture setting lets you create an event capture file (.rec), which is a log of communication, input, and screen output that occurs between the 375 Field Communicator and a device (HART only). When working with technical support personnel, you may be asked to create an event capture file to help troubleshoot issues that cannot be isolated or resolved by normal means. The event capture file can then be transferred to your PC and sent to technical support personnel for review.

Tap the desired radio button to activate the event capture feature. The radio button will be highlighted black when selected. To delete an event capture, tap the **DELETE EVENT FILE** button.

NOTE

While event capture is enabled, device warning messages will not appear.

To create and send an event capture file to technical support personnel:

1. Enable event captures and tap **OK**.
2. Start the HART application.
3. Enter a file name for the event capture file and tap **OK**. The file will be saved to a default location.
4. Perform the requested operations to capture the data.
5. Use the Easy Upgrade Programming Utility to transfer the file from your 375 Field Communicator to your PC. See the Easy Upgrade Programming Utility online Help for details.
6. Send the event capture file to technical support personnel.

Exit to 375 Main Menu

Double-tap **Exit to 375 Main Menu** if you want to return to the 375 Main Menu.

Communicating with a PC

IrDA

The 375 Field Communicator can communicate with PCs using infrared technology. IrDA is a PC interface supported for the transfer of device descriptions, software updates, configurations, event captures, application licenses, and ScratchPad files.

IrDA communication can either be built into the PC, such as a laptop, or provided through an adapter such as a USB to IrDA adapter. Refer to your IrDA manual for installation and operating instructions.

Throughput for infrared communications with the 375 Field Communicator is approximately 4 kilobytes/second. The maximum recommended distance between the IrDA and PC is 18 inches.

Card Readers

The 375 Field Communicator can also communicate with PCs using a USB Secure Digital card reader. Insert the 375 System Card into a card reader, and system software upgrades and device descriptions can be sent to the System Card using the Easy Upgrade option. When downloading a large system software upgrade or many device descriptions, a card reader may be required.

NOTE
Using Windows Explorer and a card reader to transfer files between the System Card and a PC can corrupt the System Card. This operation should only be performed under the direction of technical support personnel.

The card reader will provide faster upload and download speeds than an IrDA adapter, however, it cannot be used to transfer licenses, event capture files, or user data files. See the Easy Upgrade Programming Utility online Help for details.

NOTE
The instructions in this manual are written for using the IrDA connection, not the card reader.

Listen For PC

In Listen For PC, the 375 Field Communicator is under the control of a PC application for transferring data and managing device configurations. The PC application could be one of the following:

- AMS™ Suite: Intelligent Device Manager (version 6.2 or higher), software for managing instrumentation and valves in a process plant. Currently, AMS Device Manager supports HART configurations only.
- 375 Easy Upgrade Programming Utility

NOTE

The on/off/stand by key, and the stand by and auto-off timers are disabled when the 375 Field Communicator is in Listen For PC mode.

The 375 Field Communicator must be in Listen For PC mode when communicating through IrDA.

To enter Listen For PC:

1. From the 375 Main Menu, select **Listen For PC**. A warning message will appear if the 375 Field Communicator is running on battery power when you select Listen For PC. Click OK to proceed and enter Listen for PC mode. The Listen For PC screen displays the unit name and System Card Serial Number.
2. Align the 375 Field Communicator IrDA interface with the PC IrDA interface.
3. Complete the necessary transfer(s) using the Easy Upgrade Programming Utility or AMS Device Manager. See the Easy Upgrade Programming Utility online Help for more information.
4. Tap **EXIT** to close the Listen For PC application.

If new system software was downloaded to the 375 Field Communicator System Card, an update of the Internal Flash will occur upon exit.

Transfer HART Configurations using AMS Suite: Intelligent Device Manager

A Handheld Communicator Interface kit of the AMS Device Manager (version 6.2 or higher) option lets you use the 375 Field Communicator with AMS Device Manager.

To transfer HART configurations:

1. Align the 375 Field Communicator IrDA interface with the PC IrDA interface, and enter Listen For PC mode. A 375 Field Communicator icon will appear in AMS Device Manager to indicate that all configurations from the 375 Field Communicator can be accessed.
2. In AMS Device Manager, double-click the 375 Field Communicator icon. The Expansion Module and Internal Flash folders are displayed. Once all of the configuration files are displayed, perform your tasks with AMS Device Manager.

Easy Upgrade Programming Utility

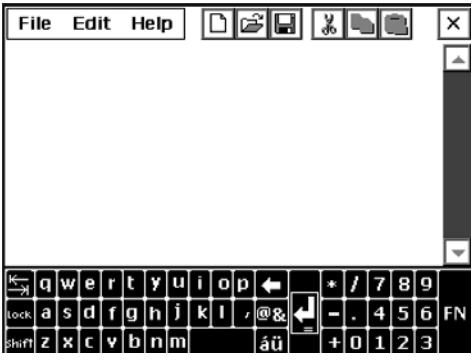
To add device descriptions (DDs), system software upgrades, or licenses, you need a System Card with the Easy Upgrade option. All 375 Field Communicators come with the basic ability to transfer event captures and user data (text) files using the Easy Upgrade Programming Utility. You can also assign a unit name to a 375 Field Communicator to uniquely identify it. For more details on use, see the Easy Upgrade Programming Utility online Help.

Using the ScratchPad application

From the 375 Main Menu, double-tap **ScratchPad** to run the ScratchPad application. ScratchPad is a text editor that you can use to create, open, edit, and save simple text (.txt) documents. You can transfer text files between a PC and the 375 Field Communicator using the Easy Upgrade Programming Utility. ScratchPad supports very basic formatting. You can also launch the ScratchPad application from within the HART or Fieldbus application by tapping the ScratchPad ( ) icon in the upper right corner of the display. This will automatically open the ScratchPad application.

NOTE
The on/off/stand by key, and the stand by and auto-off timers are disabled when the ScratchPad application is open.

Figure 2-5. Open blank document in ScratchPad



Once ScratchPad is launched, you can perform the following operations:

Create a New Document

From the Main Page in the ScratchPad application, tap the **NEW** button. An empty text window and SIP keypad will appear. You are now ready to enter text into your new document.

A new document can also be created within ScratchPad by tapping the New ( ) icon in the toolbar or by selecting **File** | **New** from the menu.

Open an Existing Document

1. From the Main Page in the ScratchPad application, select the desired file located under File Name.
2. Tap the **OPEN** button. A text window and the SIP keypad will appear. You are now ready to edit your document.

You can also open a document by selecting **File | Open** from the menu bar or by tapping the Open ( ) icon in the toolbar.

Enter Text

Using the stylus, tap the desired letters from the SIP keyboard. Using the keypad, press the desired keypad button in quick repetitions to display the appropriate letter or number.

Select Text

Drag the stylus over the desired text to highlight, or to select all of the text in the document tap **Edit | Select All**.

Cut Text

1. Select the text to be cut.
2. Tap **Edit** | **Cut**.

You can also cut text by selecting text and tapping the Cut ( ) icon in the toolbar.

Copy Text

1. Select the text to be copied.
2. Tap **Edit** | **Copy**.

You can also copy text by selecting text and tapping the Copy ( ) icon in the toolbar.

Paste Text

1. Copy the text to be pasted.
2. Tap a location on the screen. This is where the text will be pasted.
3. Tap **Edit** | **Paste**.

You can also paste text by copying the text to be pasted and tapping the Paste ( ) icon in the toolbar.

Undo text

In your document, tap **Edit** | **Undo**.

Save a Document

1. In your document, tap **File** | **Save**.
2. Type the file name in the dialog box if your document is new.
3. Tap **OK**.

You can also save a document by tapping the Save ( ) icon in the toolbar.

Save a Copy

To save a copy of the current document under another name:

1. In your document, tap **File** | **Save As...**
2. Type the copy file name in the dialog box.
3. Tap **OK**.

Delete a Document

There are three options for deleting a ScratchPad document:

Option 1

1. From the Main Page in ScratchPad, select the file to be deleted.
2. Tap **DELETE**.
3. A warning will appear telling you that the selected file will be permanently deleted. If you are sure you want to delete this file, tap **Yes**.

Option 2

1. To delete from your document, tap **File | Delete**.
2. From the Delete File Page, tap the desired file to be deleted.
3. Tap **OK**.
4. A warning will appear telling you that the selected file will be permanently deleted. If you are sure you want to delete this file, tap **Yes**.
5. Tap **EXIT** when you are finished deleting files.

Option 3

Delete the .txt file using the Easy Upgrade Programming Utility. See the Easy Upgrade Programming Utility online Help for more information.

Exit ScratchPad

1. In your document, tap **File** | **Exit**.
2. Tap the **EXIT** button from the Main Page.

MANAGING STORAGE

Types of Storage

The 375 Field Communicator memory consists of four components:

1. Internal Flash—32MB non-volatile RAM. The Internal Flash memory stores the operating system and system software. It also stores the following:

- Up to 25 HART configurations
- HART event captures
- FOUNDATION fieldbus statistics
- User generated text files

   The optional Configuration Expansion Module (spare part number 00375-0043-0001) will allow you to store more than 25 configurations if needed; see below for more information.

2. System Card (SC)—an internal Secure Digital Card with non-volatile Flash memory. A copy of installable 375 Field Communicator system software exists on every System Card. The System Card also contains all HART and FOUNDATION fieldbus device descriptions.
3. RAM—32MB used only for program execution
4. Expansion Module (EM)—an optional removable memory card that snaps into the Expansion Port on the side of the 375 Field Communicator. The Configuration Expansion Module can store in excess of 500 HART configurations.

MAINTENANCE

Any maintenance, repair, or replacement of components not listed below must be performed by specially trained personnel at authorized service centers. You can perform common maintenance procedures on the 375 Field Communicator, as described below:

- Cleaning the exterior. Use only a dry lint-free towel or dampen the towel with a mild soap and water solution.
- Charging, removing, and replacing the battery pack
- Removing and replacing the System Card
- Removing and replacing the Expansion Module or Expansion Port Plug
- Removing and replacing the stand assembly
- Ensuring that all exterior screws are sufficiently tightened
- Ensuring that the Communication Terminal recess is free of dirt and debris (does not require disassembly).

Battery Information

Check the Charge Remaining

Use the Settings menu to check the charge remaining; see “Power Status” on page 2-14.

You can also check the battery charge remaining before you insert a spare battery pack.

1. Remove the battery pack from the 375 Field Communicator; see “Remove the System Card and Battery Pack” on page 2-26.
2. Turn the battery pack over and press the battery pack charge indicator button. The indication lights will illuminate based upon the amount of charge remaining in the battery. Each light represents 20 percent of charge remaining. The battery is fully charged when all of the indicator lights are illuminated.

Charge the Battery

To ensure a long battery life, you should not recharge the battery until it is fully discharged.

The battery can be charged separately or while attached to the 375 Field Communicator. The indication light on the charger will be green when fully charged, amber when charging, cycle between amber and green when pulse charging, and red if it is unable to charge.

Do not attempt to charge the battery pack in hazardous areas. To charge the 375 Field Communicator battery:

1. Plug the charger/power supply into a power outlet.
2. Plug the charger/power supply connection into the 375 Field Communicator. The 375 Field Communicator is fully operable while the battery is recharging.

NOTE

The charger/power supply may remain connected to the battery pack once it is fully charged. An overcharge condition will not occur.

Retrain the Battery

The retrain the battery operation will fully discharge the battery so it can be recharged to its full capacity. Perform this operation if you notice a decrease in battery life or every three to six months as a best practice. See “Retrain the Battery” on page 2-15 for more information about this operation.

To retrain the battery:

1. Remove the 375 power supply/charger if it is connected to the 375 Field Communicator.
2. Select **Retrain the Battery** from the Settings menu. The backlight intensity will be set to high, and the backlight, stand by, and auto-off timers will be disabled to quickly discharge the battery. It may take several hours to discharge the battery, depending on the amount of battery power that remained when the operation began.

3. After completely discharging the battery pack, connect the 375 power supply/charger to the 375 Field Communicator and fully charge the battery. Do not use the 375 Field Communicator on battery power until the battery has been fully charged. However, you can use the 375 Field Communicator with the power supply/charger while it is being charged.

Remove the System Card and Battery Pack

To remove the System Card and battery pack:

1. Place the 375 Field Communicator face down on a level, secure surface.
2. Loosen the two battery pack retaining screws until the top of each screw is flush with the top of the battery pack.
3. ⚠ Slide the battery off the main unit. Do not pull up on the battery pack as this could damage the power supply connector.
4. ⚠ Grasp the System Card and slide it straight out of the main unit. Do not pull up on the System Card as this could damage the card or the System Card socket.

Running a Self Test

There is no need, nor is it possible, to perform a manual self test with the 375 Field Communicator. Testing features are done automatically. A warning message will occur if a fault condition is found during these tests.

Working in an Intrinsically Safe (IS) area

The battery pack can be replaced in an Intrinsically Safe area. The Expansion Module can be installed in an Intrinsically Safe area while the 375 Field Communicator is still running.

Calibrating

It is not necessary or possible to calibrate the 375 Field Communicator. The 375 Field Communicator is a communication interface that communicates digitally with HART and FOUNDATION fieldbus devices. Voltage measurements made by the 375 Field Communicator are for use in detection of power or noise on a network, and are for reference purposes only. Your 375 Field Communicator is not applicable to NIST standards and is not subject to calibration.

Waste Disposal

Products with the following label comply with the **W**aste **E**lectrical and **E**lectronic **E**quipment (WEEE) directive, 2002/96/EC, which applies to European Union (EU) member states only.

The label indicates this product should be recycled and not treated as household waste. Customers in EU member states should go to www.emersonprocess.com for a procedure to discard any part(s) of the 375 Field Communicator.

For customers in all other world areas, if it is necessary to discard any part(s) of the 375 Field Communicator, adhere to the waste-disposal regulations applicable in your locality.

Hazardous Substances

Products with the following label are lead-free and comply with the **R**estriction **o**f the Use of Certain **H**azardous **S**ubstances in Electrical and Electronic Equipment (RoHS) directive, 2002/95/EC, which applies to EU member states only.

RoHS

The purpose of the directive is to limit the use of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB), and polybrominated diphenyl ether (PBDE) flame retardants in electronic equipment.

SECTION 3 HART FUNCTIONALITY

OVERVIEW

This section provides instruction on basic HART functionality in the 375 Field Communicator. It is based on the operation of the HART application version 3.0.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol. Other warning messages can be found in the Troubleshooting section of this manual.

⚠ WARNING

If you choose to ignore all field device status messages, every message from nuisance to critical will be ignored.

⚠ WARNING

Voltage measurements are for reference purposes only. Do not make critical process control decisions based upon these measurements.

BASIC FEATURES AND FUNCTIONS

Interpreting the HART icon

A beating hollow heart icon (♡) is displayed when the 375 Field Communicator is communicating with a live HART device. A solid beating heart is displayed when the 375 Field Communicator is communicating to a HART loop with a device in burst mode. A hollow or solid heart surrounded by rays (♡) indicates the 375 Field Communicator is in shout/deaf mode, which helps the 375 communicate with a device when it is on a noisy loop. The HART logo is displayed when communication is not occurring. This is common when only static parameters are listed.

USING A FAST KEY SEQUENCE

A Fast Key sequence is a sequence of numerical button presses, corresponding to the menu options that lead you to a given task. The Fast Key sequences are identical to the sequences used on the 275 HART Communicator. See your field device documentation for fast key sequence options.

STARTING THE HART APPLICATION

To start the HART application:

1. Turn on the 375 Field Communicator. The 375 Main Menu is displayed with the HART application highlighted.
2. Double-tap **HART Application**. If a live HART device is connected to the 375 Field Communicator, the HART application Online menu will be displayed automatically. If a device is not connected, the HART application main menu is displayed after a few seconds. To navigate back to the 375 Main Menu, press the back arrow button. From the HART application main menu, you can choose Offline, Online, Utility, or HART Diagnostics functions. The rest of this section will guide you through the HART application menus and functions.

WORKING OFFLINE

The Offline menu lets you create offline configurations, and to view and change device configurations stored in the 375 Field Communicator.

There are two types of configurations: device configurations and user configurations. A device configuration is created from a HART device that is online. A user configuration is a HART configuration that is created offline or that is transferred to a 375 Field Communicator from another program. Editing a device configuration within the 375 Field Communicator will change it to a user configuration.

The concept of partial or standard configurations does not apply to the 375 Field Communicator. All configurations are full configurations.

Creating New Configurations (Offline)

Creating a new configuration lets you create a user configuration for a specific device type and revision. To create a new HART configuration while working offline:

1. From the HART application main menu, double-tap **Offline**.
2. Double-tap **New Configuration**. The manufacturer names of the installed device descriptions are listed.
3. Double-tap the desired manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired device model to expand the list. The device revisions available for the selected device model are listed.
5. Double-tap the desired device revision.
6. If a warning appears, thoroughly read the warning, tap **CONT** to accept the warning and proceed, or tap **EXIT**.
7. Mark the configurable variables you want sent to the HART device. Double-tap **Mark all | OK** to have all variables marked. Double-tap **Unmark all | OK** to clear the marks from all variables. A “+” symbol indicates a mark to send. A “*” symbol indicates a parameter has been edited. To mark and edit variables individually:

a. Double-tap **Edit individually** to configure specific variables before sending them to a device.
b. Scroll through the list of variables and select the variable you want to mark or edit.

   To change the value for the selected variable, tap **EDIT**, change the value, and tap **ENTER**.

   To mark the selected variable, tap **MARK**. A "+" symbol indicates a mark to send. A "*" symbol indicates a parameter has been edited.
c. Repeat these steps for other variables as necessary and tap **EXIT** when you are finished.

8. To save a new configuration, double-tap **Save as...** (The SAVE button will automatically bring you to the Save as... menu.)
   a. To change the location where the configuration is saved, double-tap **Location**, select an option, and tap **ENTER**.
   b. To specify a name for the configuration, double-tap **Name**, enter the name, and tap **ENTER**.
   c. To specify the configuration type, double-tap **Config Type**, select User, and tap **ENTER**.
   d. Tap **SAVE**.

Opening Saved Configurations (Offline)

Once opened, a saved configuration lets you edit, copy to, send, delete, rename, and compare to other saved configurations. To open a saved configuration:

1. From the HART application main menu, double-tap **Offline**.
2. Double-tap **Saved Configuration**.
3. Double-tap the storage location where you saved the configuration—Internal Flash Contents or Configuration EM (Expansion Module) Contents.
4. Double-tap the desired configuration to open the menu selection.

   The FILTR button opens a menu that provides both sort and tag filter options. These options let you customize your view of saved device configurations.
   - Sort lets you group and display device configurations according to your choice of name, tag, or descriptor.
   - Tag Filter lets you customize your group according to what you entered with Sort by picking characters from the device name, tag, or descriptor.

When setting up a filter, you can use two special characters: the period (.) and the asterisk (*). The period replaces a single character of any value. The asterisk is used to represent a string of alphanumeric characters of any value.

For example, if you want to list all configurations that have a tag or name of P - 001 to P - 300, enter “P - *” in the filter. If you want to list configurations that have a tag or name that begins P - 0 and ends with a 7, set the filter to “P - 0.7”.

The XPAND button lets you view the tag, manufacturer, device type, descriptor, and the configuration type. Tap **CMPRS** to return to the previous compressed screen.

Edit a Saved Configuration (Offline)

The Edit option lets you edit a saved configuration while working offline. To edit a saved configuration:

1. Open a saved configuration.
2. From the Saved Configuration menu, double-tap **Edit**.
3. If a warning appears, thoroughly read the warning, tap **CONT** to accept the warning and proceed, or tap **EXIT** to end this operation.
4. Mark the configurable variables you want saved in the HART configuration. Double-tap **Mark all | OK** to have all variables marked. Double-tap **Unmark all | OK** to clear the marks from all variables. To mark and edit variables individually:
   a. Double-tap **Edit individually** to configure specific variables before sending them to a device.
   b. Scroll through the list of variables and select the variable you want to mark or edit.

      To change the value for the selected variable, tap **EDIT**, change the value, and tap **ENTER**.

      To mark the selected variable, tap **MARK**. A “+” symbol indicates a mark to send. A “*” symbol indicates a parameter has been edited.
   c. Repeat these steps for other variables as necessary.
   d. Tap **Exit**.
5. Tap **SAVE**.

Copy a Saved Configuration (Offline)

The Copy to... option lets you copy a saved configuration to a new storage location. To copy a saved configuration:

1. Open a saved configuration.
2. From the Saved Configuration menu, double-tap **Copy to...**
3. Choose the storage location from which you want to open the configuration—Internal Flash or Configuration Expansion Module (EM) and tap **ENTER**.
4. Double-tap **Name**, enter the name of the configuration, and tap **ENTER.**
5. Tap **SAVE** to copy the configuration to a new location.

Send a Saved Configuration to a Connected Device

The Send option lets you send the selected configuration to a connected device. From the Saved Configuration menu, double-tap **Send**. The 375 Field Communicator will then send the configuration to a connected device that is compatible with the configuration.

Delete a Saved Configuration (Offline)

The Delete option lets you remove configurations one at a time. To delete a configuration from the 375 Field Communicator storage:

1. Open a saved configuration.
2. From the Saved Configuration menu, double-tap **Delete**.
3. Tap **Yes** to confirm the deletion.

Rename a Saved Configuration (Offline)

The Rename option lets you change the name of a saved configuration. To rename a saved HART configuration:

1. Open a saved configuration.
2. From the Saved Configuration menu, double-tap **Rename**.
3. Double-tap the file you want to rename.
4. Enter the new file name and tap **ENTER**.
5. Tap **SAVE**.

Compare Two Saved Configurations (Offline)

Any two configurations can be compared. However, in order to compare two configurations of the same field device, the following conditions must be met:

- Device type (including manufacturer), device revision, and DD revision must match exactly. A dialog box will appear if the configuration is different, however, you will not be told the differences.
- Configurations can only be compared against other configurations containing the same set of variables. The 375 Field Communicator notifies you if this condition is not met.

The format of data storage must match exactly. The 375 Field Communicator notifies you if this condition is not met.

1. From the Saved Configuration menu, double-tap **Compare**.
2. Choose the storage location—Internal Flash or Configuration Expansion Module and tap **ENTER**.
3. Double-tap **Name** to select the configuration file.
4. Double-tap the desired file to compare.
5. Tap **COMP** to compare the configurations.
6. Tap **OK** when you are finished reading the window.

WORKING ONLINE

The Online menu displays data for the HART device to which you are connected. The 375 Field Communicator can communicate with a transmitter from the control room, the instrument site, or any wiring termination point in the loop.

Connecting to a HART loop

Connect the 375 Field Communicator with the appropriate connectors in parallel with the instrument or load resistor. The HART connections are not polarity sensitive.

In order for the 375 Field Communicator to function properly, a minimum of 250 ohms resistance must be present in the HART loop.

For information about intrinsically safe connections, see Appendix B.

NOTE
Dynamic variables shown while online represent the digital data being sent from the device.

There are three terminals on the top of the 375 Field Communicator. Two are red and one is black. Each red terminal is a positive connection for its protocol. The black terminal is a common terminal shared by both protocols. An access door ensures only one pair of terminals is exposed at any one time; see Figure 3-1. Several markings indicate which pair of terminals is for which protocol.

Figure 3-1. HART terminal access door

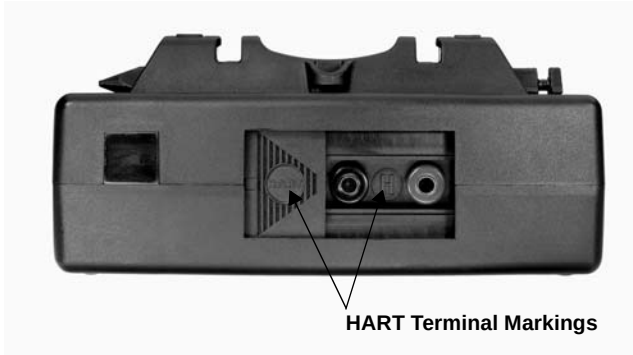


Figure 3-2 illustrates how to connect the 375 Field Communicator to a HART loop.

Figure 3-2. Connecting to a HART loop

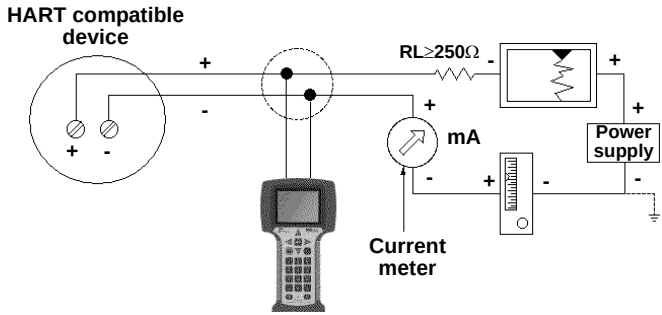


Figure 3-3 illustrates how to connect the 375 Field Communicator directly to the terminals of a HART device.

Figure 3-3. Connecting directly to a HART device

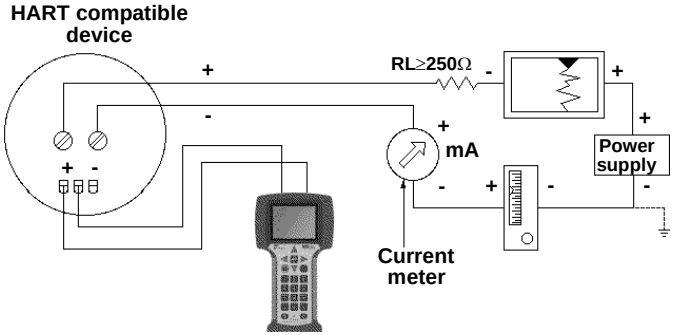
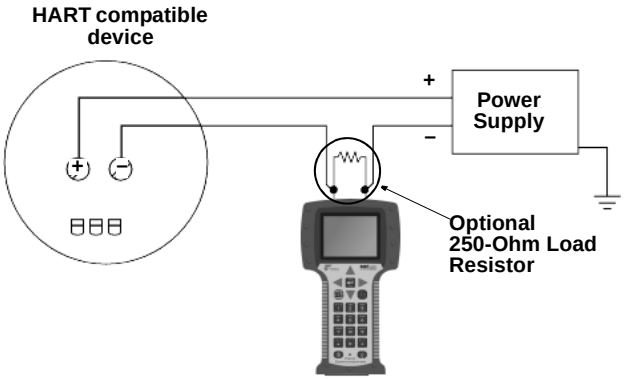


Figure 3-4 illustrates how to connect the optional 250 ohm resistor. Attaching a resistor is necessary if less than 250 ohms resistance is present in the HART loop.

Figure 3-4. Connecting with a 250 ohm resistor



To temporarily install the optional 250 ohm load resistor:

1. Insert the load resistor into the lead set jacks.
2. Open the loop to allow connection of the resistor in series in the loop.
3. Close the loop using the lead set connectors.

Displaying the Online menu

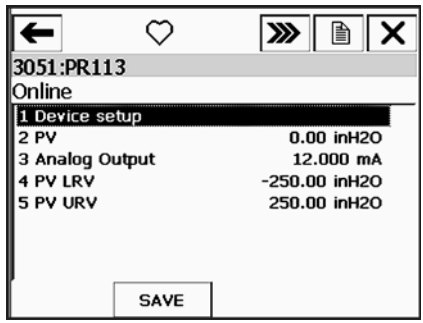
The Online menu is the first menu to appear when connecting to a HART compatible device. It is structured to provide important information about the connected device. This menu typically displays critical, up-to-date process information that is continuously updated, including device setup, primary variable (PV), analog output (AO), PV lower range value (LRV), and PV upper range value (URV). See your field device user's manual for more information.

Because the Online menu displays important information, some menus provide instant access to this window. When access is available, the HOME button is displayed to return you to the HART Online menu.

Once you have made changes to the parameters, you may send them to the device. An asterisk will appear next to the parameter name of any un-sent item.

The configuration parameters for devices vary widely from device to device and are defined in the device description. Refer to your field device user's manual for more information. To view process information for a connected device, select a menu item from the Online menu.

Figure 3-5. Online menu example



Saving an Online Configuration

When a configuration is saved from a connected device, the configuration will be saved as a device configuration.

To save the configuration in the connected device:

1. Connect the 375 Field Communicator to a HART loop or directly to the device and turn on the 375 Field Communicator.
2. Double-tap **HART Application** from the 375 Main Menu. The HART Online menu appears.
3. Tap the **Save** button.
   a. To set the location where the configuration will be saved, double-tap **Location**, select Internal Flash or Configuration EM (expansion module), and tap **ENTER**.
   b. To specify a name for the configuration, double-tap **Name**, enter the name, and tap **ENTER**.
   c. To specify the configuration type, double-tap **Config Type**, select Device, and tap **ENTER**.
4. Tap **Save**. If the configuration already exists, a message will be displayed. Tap **YES** to overwrite the older version with the new version, or tap **NO** to return to the Save as screen.

Displaying the Device Setup submenu

The Device Setup menu accesses every configurable parameter of the connected device.

The Online menu displays critical process information that is continuously updated. If the primary variable and related engineering units are too long, they will not appear on the Online menu. Double-tap to view the item and the related engineering units when it appears truncated on the Online menu.

Double-tap **Device setup** to view the process variables, diagnostics and service, basic setup, detailed setup, and review menus.

Process Variables (PV)

The PV menu lists all process variables and their values. Process variables are continuously updated when this screen is displayed.

Diagnostics and Service

The Diagnostics and Service menu offers device and loop tests as well as calibration options. The diagnostics and service operations that are available vary widely from device to device and are defined in the device description.

The *Test device* menu lists the status as well as self and master test of the device. Test device initiates a diagnostic routine at the device and can report an electronics failure, as well as other failures that can affect performance.

Loop test is used to set the output of the device at a specified analog value, and may be used to test the integrity of the loop and the operation of indicators, recorders, or similar devices in the loop.

Calibration is used to perform such operations as performing a sensor trim, D/A trim, and scaled D/A trim.

Basic setup

The Basic setup menu provides quick access to a number of configurable parameters including tag, unit, range values, and damping.

The options available in the Basic setup menu are the most fundamental tasks that can be performed with a device. These tasks are a subset of the options available under the Detailed setup menu.

The *Tag* alphanumeric identifies a specific device. Changing the unit option affects the engineering units that are displayed. Changing range values changes the analog output scaling. Changing damping affects the response time of the transmitter and is often used to smooth the output when there are rapid input variations.

Detailed setup

The Detailed setup menu provides access to every editable device parameter and all device functions. The Detailed setup menu varies widely from one HART compatible device to another. Functions in this menu can include tasks such as characterization, configuration, and sensor and output trims.

Review

The Review menu lists all of the static parameters read from the connected device, including information about the device and sensor setup and limitations. It also includes information about the connected device such as tag, materials of construction, and device software revision.

Displaying Graphics

The HART application now offers graphical views of device data by using the enhanced Electronic Device Description Language (EDDL) technology. Device data can be presented as images, charts, and graphs. These options are displayed as items in the Online menu and its submenus. The placement of the Graphics options in the menus will vary widely from device to device because it is determined by the device manufacturer.

To view the graphical representations, you need a device with enhanced EDDL, a 375 Field Communicator with a Graphics license, and 375 system software version 2.0. Only devices with enhanced EDDL offer graphical representations of data. If the 375 Field Communicator does not have a Graphics license, enhanced DDs can still be used. However, the graphical representations will not be displayed.

The Graphics license can be purchased through your 375 sales representative. Once purchased, the Graphics license can be enabled from the Internet using the Easy Upgrade Programming Utility, if you have purchased the Easy Upgrade option. See Appendix C for more information about the Graphics functionality.

USING HOT KEYS

Setting up Hot Key options

The Hot Key menu is a user-definable menu that can store shortcuts for up to 20 of your most frequently performed tasks. For example, if you change device tags and damping often, you can add options for these functions to the Hot Key menu. Once you are online, the Hot Key will automatically appear in the toolbar. To add a custom option to the Hot Key menu:

1. Select the option you want to add to the Hot Key menu from the Online menu or any of the submenus.
2. Tap and hold the Hot Key ( ) button. The Hot Key Configuration window shows the new option you are adding.
3. Tap **ADD**.
4. Tap **ALL** to add the Hot Key option for all devices supported by the 375 Field Communicator, or tap **ONE** to add the Hot Key option for only the device type to which you are currently connected.
5. If the message “Mark as read only variable on Hot Key menu” displays, choose one of the following:

- **YES**: The variable for this option is read-only, meaning you can view but not change its value.
- **NO**: You can view and change the value for this variable.

6. Respond to the message “Display value of variable on Hot Key menu?” by choosing one of the following:

- **YES**: The value of this variable will appear on the Hot Key menu.
- **NO**: The Hot Key menu will show the name of the variable but not its value.

7. Tap the **EXIT** button on the Hot Key Configuration window to return to the original menu. The new option is added to the Hot Key menu.

Executing Hot Key options

To use a Hot Key option, you must first properly connect the 375 Field Communicator to a device. You can access the Hot Key menu from any online window. To use a Hot Key option:

1. Connect the 375 Field Communicator to a HART loop or device.
2. Tap the Hot Key button. The Hot Key menu is displayed.
3. Double-tap the desired option.

Removing Hot Key options one at a time

To remove individual Hot Key options:

1. Tap and hold the Hot Key ( ). The Hot Key Configuration window will appear.
2. Double-tap the menu option you want to remove.

NOTE

Range Values is a predefined option and cannot be removed. It provides quick access for viewing or changing the range for a device.

---

3. Tap the **DEL** button.
4. When you are done, tap **EXIT** to close the Hot Key Configuration window.

Removing all Hot Key options

To remove all Hot Key options currently defined:

1. From the HART application main menu, double-tap **Utility**.
2. Double-tap **Configure HART Application**.
3. Double-tap **Storage Cleanup**.
4. Double-tap **Hotkey Menu**.
5. Tap **YES** if you are sure you want to delete all the items from the Hot Key menu. Tap **NO** to return to the Storage Cleanup menu.

CONFIGURING THE HART APPLICATION

Changing the HART Polling option

Use the HART polling option to configure your 375 Field Communicator to automatically search for all or specific connected devices. Most HART device installations contain one device per loop and the device address is zero.

To have more than one device per loop, wire the devices in parallel and place into “Multidrop” mode. This mode is enabled by changing the address from zero to any address between 1-15. After the mode is enabled, the analog output of each device is fixed and no longer represents any variable.

To change the polling option:

1. From the HART application main menu, double-tap **Utility**.
2. Double-tap **Configure HART Application**.
3. Double-tap **Polling**.
4. Select one of the following polling options:

- **Never Poll** - Connects to a device at address 0 and if not found, it will not poll.
- **Ask Before Polling** - Connects to a device at address 0 and if not found, you will be asked if you want the communicator to poll for devices at addresses 1-15.
- **Always Poll** - Connects to a device at address 0 and if not found, the communicator will automatically poll for devices at addresses 1-15.
- **Digital Poll** - Polls addresses 0-15, regardless if a device is found at address 0. To find individual device addresses, use this option to find each connected device in the loop and list them by tag number.
- **Poll Using Tag** - Lets you enter the tag of the device. You will be prompted to enter a tag name upon starting the HART application.
- **Poll Using Long Tag** - Lets you enter the long tag of the device. You will be prompted to enter a tag name upon starting the HART application. (Only supported in HART Universal revision 6 devices.) Double-tap when the tag is truncated to display the full tag.

5. Tap **Enter**.

Refer to your device-specific manual for information about changing a device polling address.

Changing Ignored Status Messages

The 375 Field Communicator displays status messages from the connected HART device. The Ignore Status option lets you specify the number of field device status messages that are ignored, extending the time between displayed messages. The default is 50 messages. If you choose to ignore all field device status messages, every message from nuisance to critical will be ignored.

To change the number of ignored status messages:

1. From the HART application main menu, double-tap **Utility**.
2. Double-tap **Configure HART Application**.
3. Double-tap **Ignore Status**.
4. Enter the number of status messages you want ignored before the next message is displayed. You can specify a number from 50 to 500.
5. ⚠ Tap **ENTER**. All field device status messages will be ignored until the quantity specified has been reached.

Changing the Menu Title

The HART 6 Tag menu lets you choose if the HART short or long tag will be displayed in the menu title for HART revision 6 devices. The short tag can have up to 8 characters, and the long tag can have up to 32 characters. These tags can be edited at any time. If the long tag does not fit on the screen, an ellipsis will be shown at the end of the tag. The location of these parameters in the Online menu will vary from device to device because it is determined by the device manufacturer.

To select a HART tag for the menu title:

1. From the HART application main menu, double-tap **Utility.**
2. Double-tap **Configure HART Application**.
3. Double-tap **HART 6 Tag**.
4. Select Show Long Tag to display the HART long tag, or select Show Short Tag to display the HART short tag.
5. Tap **ENTER**.The 375 Field Communicator will continue to use the option you selected until you change the setting.

Storage Cleanup

The Storage Cleanup menu lets you delete the following items:

- **Internal Flash -** By selecting **YES**, you will remove all configurations saved in the Internal Flash.
- **Configuration Expansion Module** - By selecting **YES**, you will remove all configurations saved in the Configuration Expansion Module.
- **Hotkey Menu** - By selecting **YES**, you will delete all items from the Hot Key menu.

Viewing Available Device Descriptions

The Available Device Descriptions menu lets you view all the device descriptions in the 375 Field Communicator. HART device descriptions enable the 375 Field Communicator to recognize and configure specific HART-compatible devices. To view the currently installed HART device descriptions:

1. On the HART application main menu, double-tap **Utility**.
2. Double-tap **Available Device Descriptions**. The manufacturer names of the installed device descriptions are listed.
3. Double-tap the desired device manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired device model. The device revisions available for the selected model are listed. One of the following icons will appear next to each device description to indicate its status:

- A tested device description can be used with the system software version in the 375 Field Communicator.

- An untested device description has not been formally tested for use with the system software version in the 375 Field Communicator. The device description can be used, but you may experience unexpected results.

- An incompatible device description cannot be used with the system software version in the 375 Field Communicator.

Simulating an Online Connection to a HART device

The 375 Field Communicator has a simulation mode that lets you simulate an online connection to a HART-compatible device without actually connecting to a device. Simulation mode is a training tool that helps you become familiar with devices before configuring them in a critical environment. A simulated configuration cannot be saved. Not all device descriptions have been optimized to run under simulation.

To simulate a connection to a HART device:

1. From the HART application main menu, double-tap **Utility**.
2. Double-tap **Simulation**. The manufacturers with device descriptions installed in the 375 Field Communicator are listed.
3. Double-tap the desired manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired model to expand the list. The device revisions available for the selected model are listed.
5. Double-tap the desired device revision. Refer to the device manual to determine the device revision.
6. If a warning appears, thoroughly read the warning, tap **CONT** to accept the warning and proceed, or tap **EXIT** to return to the Utility menu. (This warning will not appear if your device is tested.) The Online menu for the simulated device is displayed. You can now use the 375 Field Communicator as if it were connected to the selected device and perform any online task.

RUNNING HART DIAGNOSTICS

DC Voltage Measurement (HART Terminals)

The HART DC voltage measurement will take a voltage reading at the HART connector and display it on the screen.

To check the device voltage:

1. From the HART application main menu, double-tap **HART Diagnostics**.
2. Double-tap **DC Voltage Measurement**. The DC voltage measurement is displayed. Tap **OK** when done viewing the measurement. To refresh the screen, double-tap **DC Voltage Measurement** from the HART Diagnostics menu. Voltage measurements are for reference purposes only.

DISCONNECTING FROM A HART DEVICE

Prior to disconnecting the 375 Field Communicator from a HART device, be sure to check the following items:

- Determine if you want to save a configuration.
- Verify methods (e.g., calibration, loop test) are complete.
- Resolve any un-sent data to the device.

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SECTION 4 FIELDBUS FUNCTIONALITY

OVERVIEW

This section provides instruction on basic fieldbus functionality in the 375 Field Communicator. It is based on the operation of the FOUNDATION Fieldbus application version 4.0.

SAFETY MESSAGES

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operation. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol. Other warning messages can be found in the Troubleshooting section of this manual.

⚠ WARNING

If a segment is connected to a host system, the changes made with the 375 Field Communicator may not be recorded in the host system's permanent database. Verify the changes in the database. Otherwise, this could cause unpredictable results and, depending upon your application, process disruption leading to property damage, serious injury, or death. Ensure all safety precautions and work procedures have been followed.

⚠ WARNING

Changing device parameters could adversely affect the control of your process. Put the control loop in Manual/Out of Service before applying changes. Verify the output before returning the control loop to Auto. Failure to do so could result in property damage, serious injury, or death. Ensure all safety precautions and work procedures have been followed.

⚠ WARNING

The 375 Field Communicator draws approximately 17 mA from the fieldbus segment. Be sure the power supply or barrier on the fieldbus segment has the capacity to provide this additional current. If a heavily loaded fieldbus segment is drawing near the capacity of the segment's power supply, connecting the 375 Field Communicator may result in loss of communication.

BASIC FEATURES AND FUNCTIONS

Link Active Scheduler (LAS)

All segments have one and only one Link Active Scheduler (LAS). The LAS operates as the bus arbiter for the segment. The 375 Field Communicator is set up to always be the last node to become the LAS on a segment.

The devices that are capable of becoming the LAS are called link master devices. All other devices are referred to as basic devices. When a segment first starts up, or upon failure of the existing LAS, the link master devices on the segment bid to become the LAS. The link master that wins the bid (i.e., the one with the lowest address) begins operating as the LAS immediately upon completion of the bidding process. Link masters that do not become the LAS can act as LAS backups by monitoring the segment for failure of the LAS and then bidding to become the LAS when a LAS failure is detected.

Although the 375 Field Communicator is capable of becoming the LAS, it does not maintain the communication schedule and should not be thought of as a backup LAS.

Only one device can communicate at a time. Permission to communicate on the bus is controlled by a centralized token passed between devices by the LAS. Only the device with the token can communicate. The LAS maintains a list of all devices that need access to the bus. This list is called the Live Device List; see "Displaying the Live Device List" on page 4-9.

Device Interoperability

The 375 Field Communicator is designed to operate with a wide range of FOUNDATION fieldbus devices independent of device manufacturer. Device interoperability is achieved through the use of Device Description Language (DDL) technology supported by the Fieldbus Foundation.

Basic testing is performed on all device descriptions. In addition, each device manufacturer is asked to certify that they have thoroughly tested their device(s) with the 375 Field Communicator. If certification is not received, a warning message will display when you attempt to access an untested device.

LAS Hierarchy

When a 375 Field Communicator is connected to a live fieldbus segment, it joins the fieldbus segment but not as the LAS. This means the 375 Field Communicator can view and edit device parameters, but the control of the segment is still handled by the node that is designated the LAS for the segment. You can also read and write if there is another LAS. Prior to connecting to a host system, review the 375 Field Communicator Host System Interoperability on www.fieldcommunicator.com.

ST_REV

ST_REV is a block parameter that increments each time a block configuration has changed. While a list of parameters is displayed, the 375 Field Communicator will continuously read the ST_REV of that particular block. If it sees the ST_REV counter has incremented, it knows that there has been a change to the block, and it will automatically refresh (reread) all of the block parameters. Thus, there would only be a very short period of time before a change made by another host would appear on the 375 Field Communicator display.

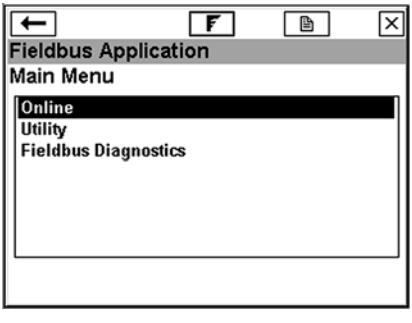
STARTING THE FIELDBUS APPLICATION

⚠ A general warning message may appear upon starting the Fieldbus application when an LAS is detected on the segment. Select YES to go to the Live Device List, NO to return to the 375 Main Menu, or HELP to get more information on the warning.

To start the Fieldbus application:

1. Turn on the 375 Field Communicator. The 375 Main Menu is displayed.
2. Double-tap **FOUNDATION Fieldbus Application**. If a live fieldbus device is connected to the 375 Field Communicator, the Fieldbus application main menu will briefly display followed by the Live Display List. Figure 4-1 shows the Fieldbus application main menu. If insufficient voltage is detected, a warning message will appear. Press OK to navigate to the Fieldbus application main menu.

Figure 4-1. Fieldbus application main menu screen



A connection warning message may appear if no communication is detected. This means that an LAS is not recognized by the 375 Field Communicator. This typically occurs when connecting to a single device.

To navigate back to the 375 Main Menu, press the back arrow button. From the Fieldbus application main menu, you can choose Online, Utility, or Fieldbus Diagnostic functions. The rest of this section will guide you through the Fieldbus application menus and functions.

Digital communication is susceptible to electrical noise; follow proper wiring instructions.

WORKING ONLINE

The Online menu displays data for the device to which you are connected. The Online menu displays critical, up-to-date process information, including the segment Live Device List, block lists, and parameter functionality. For information about intrinsically safe connections, see Appendix B, “Product Certifications”.

NOTE
It is normal for processes to take longer the greater the amount of scheduled communication. This is influenced by the number of devices and the control methods in place.

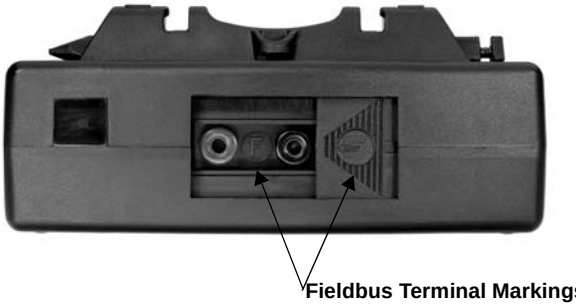
Connecting to a Fieldbus loop

Connect the 375 Field Communicator with the appropriate connectors in parallel with the instrument. Due to measurement circuitry, the 375 Field Communicator fieldbus connections are polarity sensitive. An error message will display if the instrument is connected incorrectly.

NOTE
Dynamic variables shown while online represent the digital data being sent from the device.

There are three terminals on the top of the 375 Field Communicator. Two are red and one is black. Each red terminal is a positive connection for its protocol. The black terminal is a common terminal shared by both protocols. An access door ensures only one pair of terminals is exposed at any one time; see Figure 4-2. Several markings indicate which pair of terminals is for which protocol.

Figure 4-2. Fieldbus terminal access door

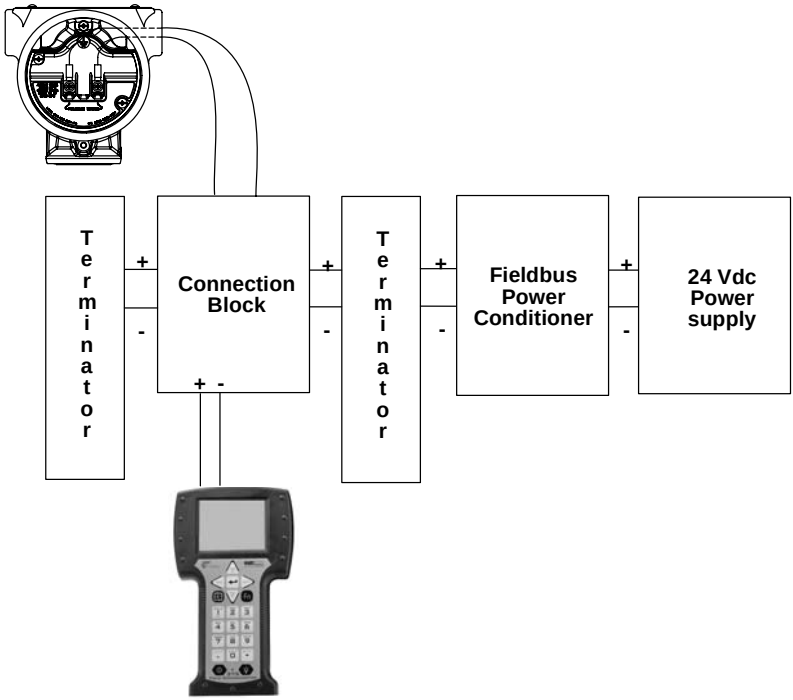


Bench Hook-Up

Figure 4-3 illustrates one method of connecting the 375 Field Communicator on a bench.

For segments that are limited in size, the power conditioner and terminators can be contained in a single wiring block.

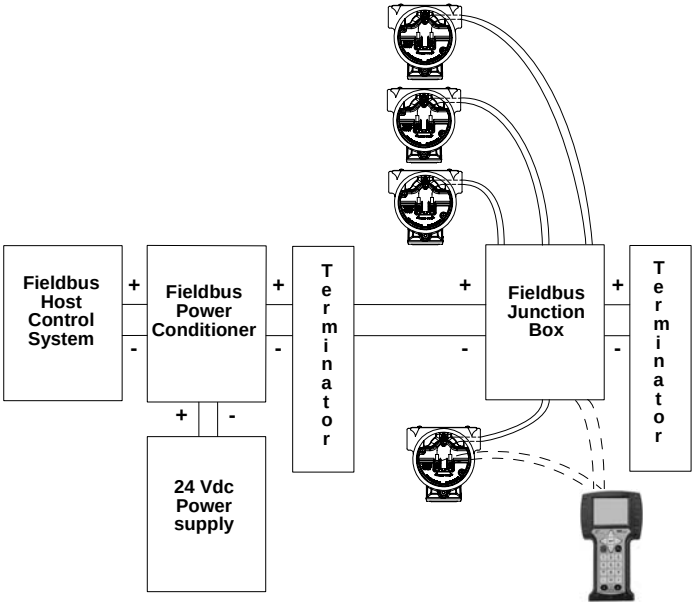
Figure 4-3. Bench wiring diagram example



Field Hook-Up

Figure 4-4 illustrates one method of connecting the 375 Field Communicator to a fieldbus segment. The 375 Field Communicator can be connected at any convenient place along the bus (segment). In the field, this is typically done at the device or at the fieldbus junction box.

Figure 4-4. Field wiring diagram example



⚠ NOTE

The 375 Field Communicator draws approximately 17 mA from the fieldbus segment. Be sure that the power supply or barrier on the fieldbus segment has the capacity to provide this additional current. If a heavily loaded fieldbus segment is drawing near the capacity of the segment's power supply, connecting the 375 may result in loss of communication.

Displaying the Live Device List

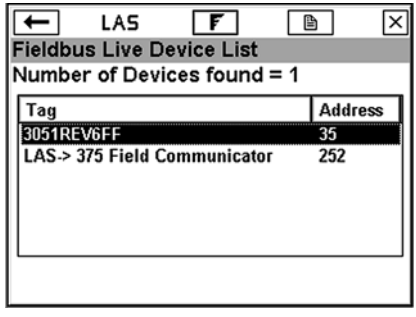
To display the active devices on a Fieldbus segment (Live Device List):

1. Connect the 375 Field Communicator to a Fieldbus segment.
2. Turn on the 375 Field Communicator.
3. On the main menu, double-tap **FOUNDATION Fieldbus Application.**
4. On the Fieldbus application main menu, choose **Online**. The Fieldbus Live Device List appears and indicates which device or host is acting as the LAS. The text *LAS* will appear at the top of the screen only when the 375 Field Communicator is the LAS. See Figure 4-5.

   If a live fieldbus device is connected to a host acting as the LAS, a precautionary message will appear. The Live Device List will then be displayed with key parameters from the connected device.

   If an existing host control system or a device capable of being the LAS is not connected, the 375 Field Communicator will act as a temporary LAS on the segment and produce a warning message. After reading and following the message instructions, tap **OK** to display the Live Device List.

Figure 4-5. Live Device List screen example



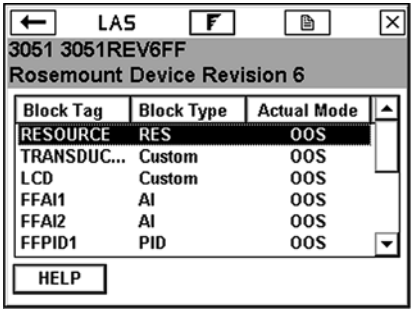
Displaying the Block List

The Block List view lists the block tag, block type, and actual mode of the device blocks, as well as Schedule, Advanced, and Detail information contained in a particular device. Consult your device manual or the Fieldbus Foundation for more information on blocks. FOUNDATION fieldbus menu trees will be on www.fieldcommunicator.com as they become available.

To view the Block List:

1. From the Fieldbus application main menu, choose **Online**. The Fieldbus Live Device List will appear.
2. Double-tap the device you want to work with.

Figure 4-6. Block list screen example



Modes

The resource, transducer, and all function blocks in the device have modes of operation. These modes govern the operation of the block. Every block supports both automatic (AUTO) and out of service (OOS) modes. Other modes may also be supported.

Types of Modes

For the procedures described in this manual, it will be helpful to understand the following modes:

AUTO

The functions performed by the block will execute. If the block has any outputs, these will continue to update. This is typically the normal operating mode.

MAN

In this mode, the output of the block can be manually overwritten for testing purposes.

Out of Service (OOS)

The functions performed by the block will not execute. If the block has any outputs, these will typically not update and the status of any values passed to downstream blocks will be “BAD”. Before you make changes to the configuration of the block, change the mode of the block to OOS. When the changes are complete, change the mode back to AUTO.

Other Types of Modes

Other types of modes are Cas, RCas, ROut, IMan and LO. For more information, see the Emerson Process Management, Rosemount Division Function Block manual, document 00809-0100-4783.

Mode Parameters

Mode parameters are used to change the block mode from one state to another. There are four types of mode parameters: Target, Actual, Permitted, and Normal.

The Target mode is the mode the user assigned to a block. The Target mode parameter is used to change a block to a desired mode.

The Actual mode is the current mode of the block.

The Permitted mode lists the modes that are allowed for a block. Setting the Permitted modes prevents unauthorized changes to the operating mode of a block. To do this, configure the Block:Mode Permitted parameter to allow only the desired operating modes. It is recommended to always select OOS as one of the Permitted modes.

The Normal mode is the mode the block should be set to during normal operation conditions. Only the Permitted modes will be displayed.

Locate Mode Parameters

In the resource and transducer blocks, the mode parameters are normally found in the Process menu. In all other function blocks, they are found in the Common Config menu. The mode parameters will also be included in the All parameter list; see “Working with Device Blocks” on page 4-14. You can view and edit the Target mode parameter by pressing the **MODE** button from a block list screen or by locating it in a menu.

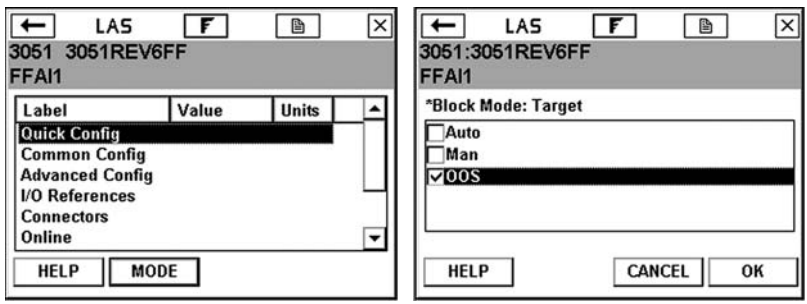
⚠ Change Modes

Whenever you need to change the parameters or properties of a block, you need to change the mode. A warning message may appear whenever the mode of any block is included in a list of parameter changes to be sent to a device.

To change the block mode:

1. From the Block list screen, double-tap a block.
2. Tap the **MODE** button.
3. Remove the checkmark next to the current mode by tapping the checkbox next to it. An asterisk (*) symbol will appear next to **Block Mode: Target** to indicate a change has been made to the Target mode. Only the permitted modes will be displayed. If the mode checkboxes are read only, the block may have been set to allow only one mode.
4. Tap the checkbox next to a mode to select it as the new Target mode. A checkmark appears.
5. Tap **OK**.
6. When the warning message appears, thoroughly read it and tap **YES** to send the change to the device, or tap **NO** to cancel the operation. A Mode Change screen showing the Target mode and Actual mode will be displayed until the Actual mode is updated. Tap **CLOSE** to close the Mode Change screen.

Figure 4-7. Device Block menu and Mode Screen



Working with Device Blocks

The block menu is a submenu of the block list. Block menus display block information for the fieldbus device to which you are connected.

If the device description is not installed in your 375 Field Communicator, an error message will appear. New device descriptions will be made available on a regular basis. You can download new device descriptions to your 375 Field Communicator if you have the Easy Upgrade option for the Easy Upgrade Programming Utility. See “Easy Upgrade Programming Utility” on page 2-19 for more information.

Devices that do not support transducer block menus within the device description will have the following selections: All, Process, Status, Other. If methods are incorporated into the transducer block, they will be displayed as either Diagnostic Methods or Calibration Methods. Tap **All** to display all of the parameters for the desired block. It may take several minutes to display the parameters. It is recommended that you use this only if you are unable to find your desired selection elsewhere.

If the device description supports menus, you can display the block menu by performing the following steps:

1. Display the block list. See page 4-10.
2. Double-tap the desired block tag and the block menu will appear.
3. From the block menu, double-tap the desired parameter group label category.

NOTE

The Block mode must be in the appropriate state to accept parameter changes. Typically, the mode is MAN or OOS.

Parameter Functionality

Shaded areas indicate values that cannot be changed. In initial versions of the Fieldbus application, you are able to edit only the resource, transducer, and I/O blocks. You will be able to open and view all other blocks, however, you will not be able to edit them.

Modified Parameters

An asterisk (*) will appear next to a modified parameter which has not yet been sent to the device.

Display Block Parameters for Fieldbus Devices

To display the parameters for fieldbus devices:

1. Display the Live Device List; see page 4-9.
2. Double-tap a device on the Live Device List to view the blocks in that device.
3. Double-tap the desired block.
4. Double-tap the desired parameter group. The parameters and their current values are displayed. Shaded areas indicate values that cannot be edited.

Change and Send Parameter Data

To change the values for parameters:

1. Display the parameters for the fieldbus device.
2. Double-tap the desired parameter.
3. Change the value for the parameter. (Tap **HELP** to view a description of the parameter.)
4. Tap **OK** to acknowledge the parameter change. Repeat these steps for other parameters as necessary. A “*” symbol indicates a parameter has been edited.
5. Tap **SEND** to commit your changes to the connected fieldbus device.

Run Methods (e.g., calibrations, sensor trim, diagnostic)

Select submenu choices as appropriate. Different devices have different methods associated with them, and the selections on these menus vary accordingly.

To run methods:

1. Display the Live Device List; see page 4-9.
2. Double-tap a device from the Live Device List.
3. Double-tap the desired block (typically, methods are run in the transducer block).
4. Double-tap **Methods**.
5. Double-tap the type of method you want to run, e.g., calibration, diagnostic. Follow the navigation screens to run the method.

Display Device Status

To display device status:

1. Display the Live Device List; see page 4-9.
2. Double-tap a device from the Live Device List.
3. Double-tap the desired block.
4. Double-tap **Status**. Status parameter(s) will be displayed.

Other Block List Selections

Detail Menu

To view the Detail menu:

1. Display the Live Device List; see page 4-9.
2. Double-tap the device you want to work with.
3. Scroll down the block list and double-tap **Detail**. Double-tap one of the following options:

NOTE

The physical device tag and address of a device will be read-only when, at a minimum, any of the following hosts/linking devices are detected on the segment: Rosemount 3420, DeltaV, Ovation, Allen-Bradley, Honeywell Experion PKS, or Yokogawa Stardom. To change the device tag or address, use the host system or remove the device from the segment and connect it directly to the 375 Field Communicator.

- **Physical Device Tag** designates a field device's identity in the system.
- **Address** is the data link layer node address of the device. The host control system has the ability to assign an address to a device when it is connected to a segment. The following should be taken into consideration when assigning device addresses:
    - Valid device addresses for fieldbus devices are 20 through 247 with the exception of the addresses between V(FUN) and V(FUN) + V(NUN)-1 as defined for the 375; see "Configuring the Fieldbus application" on page 4-21. These parameters are available in the Polling menu.
    - Addresses between 16 and 19 are usually reserved for host systems. A device should **not** be assigned in this address range.
    - Addresses below 16 are not available.
    - Addresses between 248 and 251 are temporary addresses. Devices without a tag or address will come up on the segment at these addresses.
    - Addresses in the range 252 to 255 are reserved for visitors, such as the 375 Field Communicator.
- **Device ID** is the unique number identifier for each device. It is set by the device manufacturer and cannot be changed.
- **Device Revision** is the manufacturer revision number. It is used by an interface device to locate the device description file for the resource and cannot be changed.

4. Using the SIP keyboard, enter the new information.
5. Tap **OK**.

Change the I/O Block Schedule

NOTE

You cannot schedule I/O blocks when, at a minimum, any of the following hosts/linking devices are detected on the segment: Rosemount 3420, DeltaV, Ovation, Allen-Bradley, Honeywell Experion PKS, or Yokogawa Stardom. To schedule I/O blocks, use the host system or remove the device from the segment and connect it directly to the 375 Field Communicator.

To change the schedule:

1. Display the Live Device List; see page 4-9.
2. Double-tap the device you want to work with.
3. ⚠ Scroll down the block list and double-tap **Schedule**. The I/O Block Schedule window will appear. Changing the I/O Block Schedule would typically be done on the bench (not connected to a control system) when you want to execute an I/O block to verify that the outputs of the block are being computed correctly.
4. Using the drop-down menu, select the appropriate MacroCycle.
5. Tap the checkbox next to the I/O blocks that are to be scheduled.
6. Tap **OK**. This will schedule the blocks and set the mode on these blocks to Auto.
7. After reading the note, tap **OK** to acknowledge that the I/O block(s) were successfully scheduled.

Display Advanced Features

To view the advanced features, including Network Parameters:

1. Display the Live Device List; see page 4-9.
2. Double-tap the device you want to work with.
3. Scroll down the block list and double-tap **Advanced**. Double-tap the desired Label to view the label values.

Tap the **SAVE** button to save these values as a text file to better facilitate network troubleshooting. These files can be transferred to a PC using the Easy Upgrade Programming Utility, and they will appear in the User Data tab.

Instantiate Blocks

The Instantiate Block menu lets you add function and transducer blocks to a connected device. This menu item appears only if the fieldbus device contains instantiable block types. Once a block has been instantiated, the block list view will display the new block. The Actual mode of the new instantiated block will be set to OOS.

To instantiate a block:

1. Display the Live Device List; see page 4-9.
2. Double-tap a device.
3. Scroll down the block list and double-tap **Instantiate Block**.
4. Tap the type of block that you want to add to the device.
5. Tap **OK** to add the block to the device. Tap **CANCEL** to exit the screen without adding a block.
6. When the warning message appears, tap **YES** to instantiate the block, or **NO** to cancel the operation.

NOTE

You cannot instantiate or delete blocks when, at a minimum, any of the following hosts/linking devices are detected on the segment: Rosemount 3420, DeltaV, Ovation, Allen-Bradley, Honeywell Experion PKS, or Yokogawa Stardom. To instantiate or delete blocks, use the host system or remove the device from the segment and connect it directly to the 375 Field Communicator.

Delete Instantiated Blocks

The Delete Block menu lets you delete instantiated blocks from a fieldbus device; you cannot delete permanent blocks. You can delete only one instantiated block at a time, and the Actual mode in the device must be set to OOS. If the Delete Block menu item is selected and no blocks have be instantiated in the device, an error message will appear. Once a block has been deleted, the block list will be refreshed and it will not display the deleted block.

To delete an instantiated block:

1. Display the Live Device List; see page 4-9.
2. Double-tap the device you want to work with.
3. Scroll down the block list and double-tap **Delete Block**.
4. Tap the block that you want to delete from the device.
5. Tap **OK**.
6. When the warning message appears, tap **YES** to delete the block, or **NO** to cancel the operation.

NOTE

Some devices restart after a block has been instantiated or deleted, causing a loss in communication between the 375 Field Communicator and the device. Once the device and 375 Field Communicator resume communication, the Live List will be displayed.

Displaying Graphics

The FOUNDATION Fieldbus application now offers graphical views of device data by using the enhanced Electronic Device Description Language (EDDL) technology. Device data can be presented as images, charts, and graphs. These options are displayed as items in the Online menu and its submenus. The placement of the Graphics options in the menus will vary widely from device to device because it is determined by the device manufacturer.

To view the graphical representations, you need a device with enhanced EDDL, a 375 Field Communicator with a Graphics license, and 375 system software version 2.0. Only devices with enhanced EDDL offer graphical representations of data. If the 375 Field Communicator does not have a Graphics license, enhanced DDs can still be used. However, the graphical representations will not be displayed.

The Graphics license can be purchased through your 375 sales representative. Once purchased, the Graphics license can be enabled from the Internet using the Easy Upgrade Programming Utility, if you have purchased the Easy Upgrade option. See Appendix C for more information about the Graphics functionality.

CONFIGURING THE FIELDBUS APPLICATION

Changing the Fieldbus Polling Addresses

Polling is a method of determining which devices are present on a network. The V(FUN) is the first unpolled node address. V(NUN) is the number of unpolled node addresses. The addresses between V(FUN) and V(FUN)+V(NUN)-1 are not polled. The default value for V(FUN) is 200 and the default value for V(NUN) is zero. Narrowing the range of devices being polled provides a quicker Live Device List refresh.

The DeltaV System Polling checkbox instructs the 375 Field Communicator to use the same polling scheme as DeltaV.

To change the polling addresses:

1. From the Fieldbus application main menu, double-tap **Utility**.
2. Double-tap **Polling**.
3. Enter addresses in the V(FUN) and V(NUN) fields and tap **OK**.

Changing the Slot Time

From the Fieldbus Utility menu, double-tap **Link Settings**. Select the default Slot Time of eight to allow the devices to be seen on the 375 Field Communicator Live Device List. It may be necessary to change the Slot Time to 16 in order to view older devices on the 375 Field Communicator Live Device List. For a list of the affected devices, see www.fieldcommunicator.com.

Viewing Available Device Descriptions

The Available Device Descriptions List menu lets you view all the device descriptions in the 375 Field Communicator. Fieldbus device descriptions enable the 375 Field Communicator to recognize and configure fieldbus devices.

To view the fieldbus device descriptions installed on the 375 Field Communicator:

1. On the Fieldbus application main menu, double-tap **Utility**.
2. Double-tap **Available Device Description List**. The manufacturer names of the installed device descriptions are listed.
3. Double-tap the desired device manufacturer to expand the list. The models available for the manufacturer are listed.
4. Double-tap the desired device model. The device revisions available for the selected model are listed. One of the following icons will appear next to each device description to indicate its status:

- A tested device description can be used with the system software version in the 375 Field Communicator.

- An untested device description has not been formally tested for use with the system software version in the 375 Field Communicator. The device description can be used, but you may experience unexpected results.

- An incompatible device description cannot be used with the system software version in the 375 Field Communicator.

RUNNING FIELDBUS DIAGNOSTICS

The Fieldbus Diagnostics menu lets you run diagnostics for troubleshooting fieldbus networks and devices. You can check the DC voltage, the noise level at low frequencies, and the signal level and communication status. The selected test(s) will be automatically repeated and the test results will be updated in the Diagnostics Results screen.

To view the values associated with the status indicators or the possible causes of the values, run the diagnostic test, highlight the test on the Diagnostics Results screen, and tap **HELP**.

DC Voltage and Noise Level Measurement

The DC voltage test will display the amount of DC voltage on a segment, and the noise level test will display the amount of noise on the segment. The word **Limit** will be displayed if the DC voltage measurement is out of the -37 V to 37 V range or if the noise level measurement is greater than 2.2 V.

These tests will display the measurement value, measurement unit, and one of the status indicators listed below.

OK - The value is within the acceptable range.

High - The value is greater than the normal values.

Low - The value is lower than the normal values. The noise level test will not display this status indicator.

Error - There is an error in the measurement or within the 375 Field Communicator.

Signal Level Measurement

The signal level test determines if a 375 Field Communicator can receive signals from nodes on a segment. To measure the fieldbus signal level, make sure an LAS is on the segment. Up to 16 different nodes will be checked. The word **Limit** will be displayed if the signal level value is greater than 1.3 V.

This test will display the node address, measurement value, measurement unit, and one of the status indicators listed below.

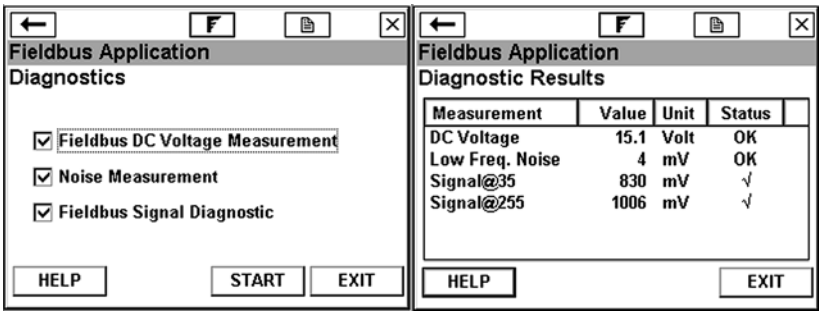
√ - All signal responses from the node were received by the 375 Field Communicator.

! - Some signal responses from the node were received by the 375 Field Communicator. Signal responses may be missed due to noise on the segment.

X - No signal responses from the node were received by the 375 Field Communicator. This may be caused by noise on the segment.

Error - The measurement value is less 75 mV or there is an error within the 375 Field Communicator.

Figure 4-8. Fieldbus Diagnostics screen examples



DISCONNECTING FROM A FIELDBUS DEVICE

Prior to disconnecting or turning off the 375 Field Communicator, be sure to check the following items:

- Verify methods (e.g., calibration) are complete.
- Resolve any un-sent data to the device.

SECTION 5 TROUBLESHOOTING

OVERVIEW

This section provides basic troubleshooting techniques for the 375 Field Communicator.

Below are methods for troubleshooting networks that are experiencing problems communicating between a field device and the 375 Field Communicator.

Troubleshooting Suggestions

Answer the questions below and use the troubleshooting tables in this section before calling technical support personnel.

- Does the control system have HART or fieldbus communication capabilities?
- Is it configured to communicate HART or fieldbus currently? Is it reporting communication problems? If not, stop communications on the control system and re-test communication with the 375 Field Communicator.
- Is there a barrier installed?
- Is the barrier capable of passing along the signal?

HART Loops

Verify the HART loop current and voltage on the field device. Almost all field devices need at least 4 mA and 12V DC to operate properly.

If there are multiple field devices on a multidrop loop, set the 375 Field Communicator to digital polling mode.

Inspection of the loop wiring can often reveal problems. The shield is normally grounded at one end only, which is usually the control system.

Verify the loop has a minimum of 250 ohms resistance. If there is not an external resistor, then, normally, the total resistance is the resistance of the process-indicating device monitoring the loop. Check the manuals for the process-indicating device to determine its loop resistance. If the resistance of the process-indicating device is unknown, it can be determined by knowing the current flow in the loop and the voltage across the process-indicating device.

The resistance can be calculated using the formula, Resistance = Voltage / Current. The 375 Field Communicator can be used to measure the voltage; see “DC Voltage Measurement (HART Terminals)” on page 3-21.

Sample values

Loop Current Flow Minimum voltage for 250 ohms.

4 mA 1 Volt
8 mA 2 Volts
12 mA 3 Volts
16 mA 4 Volts
20 mA 5 Volts

If the voltage across the process-indicating device is greater than the value listed for a given current flow, the device has at least 250 ohms of internal resistance. If the voltage is less than the value listed in the table for the given current flow, more resistance needs to be added to the loop.

If an oscilloscope is available, use it to look for noise on the loop. It is necessary to use a scope with differential mode capability or a battery powered/isolated scope to avoid grounding one side of the loop. Noise with a frequency of 500 Hz to 10,000 Hz is of particular interest, as this represents frequencies near the HART frequencies of 1200 and 2200 Hz.

Table 5-1. Troubleshooting table for HART protocol

Symptom	Possible Causes	Solution
Intermittent communication	Insufficient loop current and voltage at the field device terminals.	Verify there is at least 4 mA and 12V DC at the field device terminals; see “DC Voltage Measurement (HART Terminals)” on page 3-21.
	Noise on the field loop	
	Noise or signal distortion from the control system (i.e., noise from the power supply powering the field devices or front end analog circuitry inside the control system may be distorting the HART signal.	
	Poor wiring	Check wiring terminations and exposed signal wire for damage.
No communication with field device.	Insufficient loop resistance at the HART frequencies.	Add an additional 250 ohm resistor in series in the loop. Place the leads across the resistor and verify if communication has been restored.
	Insufficient loop current and voltage at the field device terminals.	Verify that there is at least 4 mA and 12V DC at the field device terminals; “DC Voltage Measurement (HART Terminals)” on page 3-21.
	Field device may be set to a HART address other than zero (multidrop mode).	Change Polling mode to an option other than “Never Poll”, e.g., Digital Poll.
Control system is communicating HART, but the 375 is not communicating properly.	HART communication is being prevented by the control system.	Stop HART communications on the control system and verify if communication between the field devices and the communicator is restored.

Table 5-2. Troubleshooting table for fieldbus protocol

Symptom	Possible Causes	Solution
No communication with field device.	The 375 is connected to a segment with DeltaV and the device on the same segment is being commissioned using DeltaV.	The 375 will be unable to communicate with this device until you go offline and then back online.
Connection to a segment in a bench configuration and the Live Device List remains blank (even the 375 Field Communicator does not appear).	This issue is caused by the speed at which certain LAS-enabled devices are attempting to run the segment.	Establish communication by putting the 375 on the segment first and then adding the device(s). By putting the 375 on first, it will remain the LAS and control the communication.
Unable to change the address of a device.	The 375 is unable to change the address of a device that is currently the LAS.	Establish communication by putting the 375 on the segment first and then adding the device(s). By putting the 375 on first, it will remain the LAS and allow the address change.
The 375 does not remain the LAS on a segment.	A host takes over as the LAS.	When a host is established on a segment, it will take over as the LAS. No action is required.
	A backup LAS takes over as the LAS. The lower the address and Slot Time of the device, the more likely this will occur.	See “Changing the Slot Time” on page 4-21 and “Other Block List Selections” on page 4-16.

ERROR AND STATUS MESSAGES

General Error Messages	Description
License file check failed - error code x. Please contact service center to resolve this problem. Press **OK** to turn off. (Where x indicates the test that failed.)	License file check failed during power- up.
Battery power is less than 5%. You must recharge the 375 battery, switch to a spare battery pack, or use external power. Press **OK** to turn off.	The power-up battery check detects the battery charge is below five percent while on battery.
Battery power is less than 20%. You may need to recharge the 375 battery, switch to a spare battery pack, or use external power.	The power-up battery check detects the battery charge is below 20%, and more than or equal to 5% while on battery.
Communication circuit is not responding.	CDC is not responding during the power-up
Warning: System incompatibility detected - error code x. You may start Listen for PC and use the Easy Upgrade Programming Utility to resolve this. Or you may turn off your 375 and contact service center to resolve this. (Where x is an error code indicating what the incompatibility detected was or related errors.)	Hardware version or operating system is not compatible.
Installation file is corrupt - error code x. Please call service center to resolve this problem. Press OK to turn off.	The installation is corrupt.
The 375 needs to update its software. Battery power must be more than 20% to allow for this update. You must recharge the 375 battery, switch to a spare battery pack, or use external power. Press OK to turn off.	This message occurs when on battery, and the battery percentage is less than 20% before attempting to launch program loader.
This 375 is not licensed for HART.	You are not licensed for HART functionality.
This 375 is not licensed for FOUNDATION Fieldbus.	You are not licensed for FOUNDATION fieldbus functionality.
The 375 does not detect a System Card. Please make sure your System Card is properly installed in its slot. Press OK to turn off.	This message occurs when the System Card is not properly installed in its slot.

HART Error and Help Messages	Description
"Poll Using Long Tag" allows the user to enter the long tag of the device they want to connect to.	This is a help message.
"Poll Using Tag" allows you to enter the tag of the device you want to connect to.	This is a help message.
Enter Device Long Tag.	This is a help message.
Enter the long tag that corresponds to the device you want to connect to.	This is a help message.
Hart Application Error... “hc.ddl device revision x not found.”...Refresh System Card...See User's Manual and Programming Interface for details.	This error message appears when an expected version of hc.ddl is not found.
Hart Application Error... “registry failure”...Reinstall System Files...See User's Manual for details.	This error message appears when the information describing the location of the DD's is not found in the registry.
Voltage is currently detected at the Fieldbus Terminals. Reconfigure unit and try again.	This error message appears when the HART app found voltage on the FF connector during initialization and during reconnection to a device.
CDC Error...“failure while switching to HART”...Reinstall System Files...See User’s Manual for details.	This error message appears when the HART app fails to put the CDC in HART mode for talking to a HART device.
DD Error…"tokenizer mismatch"…DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*>; HART app version x.y...Reinstall DD…See Programming Interface for details.	This error message appears when the version of the tokenizer used to tokenize the DD is not what the HART app expects.
DD Error…"linker mismatch"...DD version x.y; HART app version x.y...Reinstall DD…See Programming Interface for details.	This error message appears when the version of the linker used to link the DD is not what the HART app expects.
DD Error…"developed-to mismatch"…DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*> …See Programming Interface for solution.	This error message appears when the DD was developed and tested using a later HART app revision.
Warning: this DD is untested with the current Hart App ver <*manufacture name, device name, dev. rev. #, and DD rev. #*>…you may experience unexpected or inappropriate results…See Programming Interface for details on DD updates…Do you want to accept these risks and proceed?	This warning message appears when the DD was not tested and verified with the HART app.
DD Error…"tested-to sequence mismatch"…DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*>; HART app version x.y…See Programming Interface for solution.	This error message appears when the DD was tested with a previous version but not with this version of the HART app.
DD Error…"developed-to mismatch"...DD version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*>; HART app version x.y...Reinstall DD…See Programming Interface for details	This error message appears when the DD was developed using a later HART app revision.

DD Error…"DD header file corrupted"...Reinstall Device version <*manufacture name, device name, dev. rev. #, and DD rev. #*>; HART application <*version x.y*> …See Programming Interface for details.	This error message appears when there is a check sum error in the DD header file.
Hart Application Error…"data compression dll is missing"…Reinstall System Files...See User's Manual for details.	This error message appears when the data compression component cannot be located.
Hart Application Error…"data compression dll is corrupted"…Reinstall System Files...See User's Manual for details.	This error message appears when required functionality is missing from the data compression component.
Memory Error…"data compression memory allocation error"…Restart Unit...See User's Manual for further details.	This error message appears when HART app is unable to acquire enough memory for data compression.
DD Error…"failure while opening DD"...Reinstall Device Type x Device Rev x dd Rev x…See Programming Interface for details.	This error message appears when the system cannot open the DD file.
DD Error…"failure while uncompressing DD"...Reinstall Device revision <*manufacture name, device name, dev. rev. #, and DD rev. #*> …See Programming Interface for details.	This error message appears when an error is detected while uncompressing the DD.
Communication Error…"unexpected return value"…See User's Manual for solution.	This error message appears when an unexpected value is returned from a function call.
DD Error…"DD file corrupted"...Reinstall Device revision <*manufacture name, device name, dev. rev. #, and DD rev. #*>…See the Programming Interface for details.	This error message appears when the checksum of the DD does not match with that described in the DD header file. This error may be corrected by connecting the 375 Field Communicator to the Easy Upgrade Programming Utility and running a Refresh operation.
Forward Compatibility Blocked…DD Device Type x Device Rev x dd Rev x cannot be used in forward compatibility mode…x… Do you wish to proceed in forward compatibility mode?	This error message appears when the HART app attempts to use a DD to run in forward compatibility mode and finds that the DD is prevented from running in forward compatibility mode.
DD Not Installed…DD device type x device rev x is not installed on the System Card…See Programming Interface for details on DD updates…Do you wish to proceed in forward compatibility mode?	This error message appears when the DD for the connected device is not in the unit.

Fieldbus Error and Help Messages	Description
DDP Error 1: Unable to load DD. Press OK to return to Block List	Using Easy Upgrade, check to see if this DD is available to load into your 375 unit. If not, contact the device manufacturer.
There has been a loss of communication with one or more devices on the segment. Press OK to return to the Live Device List.	Check connection to fieldbus devices.
“The 375 has been disconnected from the segment. Press RETRY to attempt to reconnect to the segment." Press CANCEL to return to the FF app main menu. Press EXIT to exit the FF App."	Verify that the 375 lead set is still securely connected to the FF Segment and press RETRY.
SM ERROR: FAILED RESPONDER IDENTIFY	There is a problem sustaining communications with the device. Contact 375 Field Communicator customer support personnel.
FFLIB: Incompatible DD Static Description	The device description (DD) does not match the actual device correctly. Use the 375 Easy Upgrade Programming Utility to see if a new DD is available for that device. Contact 375 Field Communicator customer support personnel.
FBLIB: Device Upload aborted	Communications with a device has timed out. This should normally not happen, unless a host was selected. Contact 375 Field Communicator customer support personnel.
FMS OTHER: Parameter Check	The parameter being entered is invalid for this device. Check with the device supplier. Make sure the value entered is valid for that specific device parameter.
FMS OTHER: Exceeds Parameter Limits	The parameter being entered is outside the range of valid values for the device parameter. Check with the device supplier. Make sure the value entered is in the correct range for that device parameter
FMS OTHER: Wrong Mode For Request	The block is in the wrong mode to accept the parameter change being requested. See “Change Modes” on page 4-13 for information on how to change block modes.
SM ERROR: REMOTE ERROR INVALID STATE	An attempt to change the address of the device serving as the LAS on the segment is being made. Changing the device address of the LAS is not recommended.
DD Error…"DD file corrupted"...Reinstall Device revision *<manufacture name, device name, dev. rev. #, and DD rev. #>*…See the Programming Interface for details.	This error message appears when the checksum of the DD does not match with that described in the DD header file. This error may be corrected by connecting the 375 Field Communicator to the Easy Upgrade Programming Utility and running a Refresh operation.

REQUIRED INFORMATION FOR TECHNICAL ASSISTANCE

Before you call technical support personnel, have a detailed description of the issue, including the following information (if applicable):

- Manufacturer and model of control system (if applicable)
- 375 Field Communicator system software revision
- Manufacturer ID number or name and model revision of field device (as displayed on the 375 Field Communicator, exact spelling if possible.)
- Have the User's Manual for the field device available.
- Does communication work when certain devices or processes are not running?
- What is the total cable length run from the termination panel to the field device?
- What is the message on the 375 Field Communicator when attempting to communicate with a field device (e.g., device not found)?
- What is the serial number of the 375 Field Communicator having the communication issue?
- Is the device in burst mode?
- What is the loop impedance in the device loop? (resistance value)
- Can the 375 Field Communicator talk to the field device?
- Can AMS Suite: Intelligent Device Manager talk to the field device?
- Is the field device address set to "0"?
- Is there more than one field device on the loop?
- Is there another master (primary or secondary) on the loop? (i.e., control system, multiplexer, etc.)
- Does the control system support HART or fieldbus communications?
- If a HART multiplexer is being used, what is the manufacturer and model?
- What is the approximate field device loop length? (length of the wire)
- Are there any error messages being displayed?
- What task is being performed when the communication problem occurs?
- Are you having communication problems with multiple field devices?

Contacting Technical Support Personnel

Contact your supplier or go to http://www.fieldcommunicator.com/supp.htm for technical support contact information.

APPENDIX A REFERENCE INFORMATION

PROCESSOR AND MEMORY SPECIFICATIONS

Microprocessor 80 MHz, max 133 MHz Hitachi® SH3

Memory

Internal Flash
32 MB

System Card
128 MB (or higher) Secure Digital card

RAM
32 MB

Expansion Module
32 MB (or higher) Secure Digital card

PHYSICAL SPECIFICATIONS

Weight Approximately 2 lb. (950 grams) includes battery

Display 1/4 VGA (240 by 320 pixels) monochrome touch screen with a viewing area of approximately 6 cm by 8 cm (10 cm diagonal)
Base glass thickness 1.1 mm anti-glare
Dimensions 92 mm x 71.1 mm x 10 mm

Keypad

Twenty-five keys including four action keys, twelve alphanumeric keys, four alternate functionality keys, on/off/stand by key, and 4 navigation (arrow) keys; membrane design with tactile feedback

POWER SUPPLY SPECIFICATIONS

Power Supply Voltage

6.0 V

Battery

Five rechargeable NiMH AA batteries
Not serviceable
4 pin mini din (female) jack

Battery Operating Time

Nine hours of continuous use
Twenty hours of typical use
Forty hours in stand by mode

Power Supply/Charger

100-240 VAC, 50/60Hz,
US/UK/EU connection types included

Power Supply/Charger Technical Data

Input voltage	100 - 240 V AC ±10%
Input current	600 mA max.
Standby current	35 mA max.
Input fuse type	TES 1A 250 V Timelag
Output voltage 1	0 - 12.6 V
Output current 1	600 mA max.
Output voltage 2	0 - 13.6 V
Output current 2	1400 mA max.
Output power rating	25 W
Operating temperature	0°C - + 40°C
Storage temperature	-20°C -+ 80°C
Measurements [L x B x H]	112 mm x 51.5 mm x 29.5 mm
Total Mass	240 g.

CONNECTION SPECIFICATIONS

Battery Charger

4 pin mini din (male) plug

HART and Fieldbus Communication

Three 4mm banana plugs (one common terminal to both HART and FOUNDATION fieldbus.)

Personal Computer

IrDA port supporting up to 115 Kb/s

± 15 degrees recommended maximum angle from center line.

18 in. recommended maximum distance from center line.

ENVIRONMENTAL SPECIFICATIONS

Usage

-10°C to +50°C (14°F to 122°F)

0% to 95%RH (non-condensing) for 0°C to +50°C (32°F to 122°F)

Charge

0°C to +40°C (32°F to 104°F)

Storage

-20°C to +55°C (-4°F to 131°F) with batteries (less than one month)

Storage without batteries

-20°C to +60°C (-4°F to 140°F)

Enclosure rating

IP51 (front)

Shock

Passes the 1-meter drop test onto concrete

ORDER INFORMATION

Model	Product Description
375	Field Communicator [1]
Code	**Communication Protocol**
H	HART
F	HART and FOUNDATION fieldbus [2]
Code	**Battery Type**
R	Rechargeable NiMH Battery Pack
Code	**Power Supply/Charger**
1	Power Supply/Charger (100-240 VAC, 50/60Hz, US/UK/EU connection types included)
9	Not Included [3]
Code	**Language**
E	English
Code	**Product Certifications**
KL	CENELEC/ATEX, FM, CSA Intrinsically Safe (includes FISCO as applicable)
NA	No Approval
Code	**Easy Upgrade**
U	Easy Upgrade Option (3 year) [4]
9	Not Included
Code	**Options**
B	Spare Battery Pack, Spare Rechargeable NiMH Battery Pack [5]
C	Expansion Module, Configuration Expansion Module [6]
G	Graphics Option [2][7]

(1) Base Model 375 includes Field Communicator Unit, System Card, Leadset with Connectors, Carrying Case, Getting Started Guide, User's Manual, 375 Resource CD, Stylus and Straps.

(2) Must specify Easy Upgrade Option (Code U) when ordering this model option.

(3) This option should only be considered if the user already has a 375 Power Supply/Charger. Note: Only 375 Power Supply/Chargers are to be used with the 375 Battery Pack.

(4) The Easy Upgrade capability allows you to add new system application software and device descriptions (DDs) to the 375 for a period of 3 years. To upgrade without this feature, send the System Card to a Service Center.

(5) A fully charged battery pack is capable of delivering power for 20 hours of typical field use. If requirements exceed this specification, a second battery pack is recommended.

(6) The 375 is capable of storing a total of 25 configurations. For increased storage capacity, use the Configuration Expansion Module, which is capable of storing in excess of 500 configurations.

(7) The Graphics option enables you to access enhanced Graphical features when using the HART or FOUNDATION fieldbus applications, (as applicable).

SPARE PARTS LIST

Description	Part Number
Ruggedized 250 Ohm Load Resistor	00275-0096-0001
Rechargeable NiMH Battery Pack with Accessory Case	00375-0002-0011
Power Supply/Charger (100-240 VAC, 50/60Hz, US/UK/EU connection types included)	00375-0003-0011
Lead Set with connectors	00375-0004-0001
Mounting Straps	00375-0005-0002
Carrying Case (with straps)	00375-0005-0003
Accessory Case (clips to Carrying Case)	00375-0005-0004
Stylus (pack of 5)	00375-0006-0001
IrDA to USB Adapter(1)	00375-0015-0002
System Card (SD) Reader (with USB interface)(2)	00375-0018-0022
Expansion Port Plug	00375-0035-0001
System Card - HART with Easy Upgrade (3 years) Option(3)	00375-0042-0003
System Card - HART and FOUNDATION fieldbus with Easy Upgrade (3 years) Option(3)	00375-0042-0004
System Card - HART with Easy Upgrade (3 years) Option and Graphics(3)	00375-0042-0013
System Card - HART and FOUNDATION fieldbus with Easy Upgrade (3 years) Option and Graphics(3)	00375-0042-0014
Configuration Expansion Module	00375-0043-0001
Stand and Utility Plate	00375-0044-0001
Getting Started Guide	00375-0045-0001
User's Manual	00375-0047-0001
Resource CD	00375-0049-0001
375 Web Licensing	
FOUNDATION fieldbus license via Web(4)	00375-0142-0002
Easy Upgrade (New) license via Web(3)(4)	00375-0142-0003
Easy Upgrade (Renew) license via Web(3)(4)(5)	00375-0142-2003
Graphics license via Web(4)	00375-0142-0010
AMS Device Manager Handheld Interface Kit	
AMS Suite: Intelligent Device Manager Handheld Communicator Interface Kit (25 tags)(6)	AW7005HC00025
AMS Suite:Intelligent Device Manager Handheld Communicator Interface Kit (100 tags and above)(6)	AW7005HC20000

(1) Used to support communication between the 375 Field Communicator and the Easy Upgrade Programming Utility or AMS Device Manager (with Handheld Communicator Interface kit).

(2) The System Card (SD) reader provides a much faster alternative to upgrading a System Card using IrDA. The ability to use a card reader exists with Easy Upgrade Programming Utility version 1.6.0 or higher.

(3) The Easy Upgrade capability allows you to add new system application software and device descriptions to the 375 Field Communicator for a period of 3 years. To upgrade without this feature, the System Card would have to be sent to a Service Center.

(4) This is for field upgrades of the System Cards using the Internet. An order must include the System Card Serial Number (S/N), which can be obtained by interfacing the 375 Field Communicator with version 1.6.0 or higher of the Easy Upgrade Programming Utility. Provide an email address with the order to be notified via email that the upgrade is available for download.

(5) The Renew option is available on System Cards where the Easy Upgrade license has not been expired for more than 90 days. The expiration date can be obtained by interfacing the 375 Field Communicator with version 1.6.0 or higher of the Easy Upgrade Programming Utility.

(6) Requires AMS Device Manager version 6.2 or higher.

APPENDIX B PRODUCT CERTIFICATIONS

OVERVIEW

All 375 Field Communicators come with the main unit label (see Figure B-1). Intrinsically Safe (KL option) 375 Field Communicators also have an additional label opposite the main unit label. If the 375 Field Communicator does not contain this label (NA option), then it is considered non-IS approved.

APPROVED MANUFACTURING LOCATIONS

Emerson Process Management — Leicester, England

EUROPEAN DIRECTIVE INFORMATION

CE Compliance

CE compliance to 89/336/EEC and 94/9/EC (KL option only)

Electro Magnetic Compatibility (89/336/EEC)

Tested to specifications EN 61000-6-3 and EN 61000-6-2

ATEX Directive (94/9/EC) (KL option only)

Emerson Process Management complies with the ATEX Directive.

Specific ATEX Directive Information is located within this section and in the 375 Field Communicator Getting Started guide. See "Charger / Power Supply Certification" on page B-4 for more information.

Applicable standards EN 50014, EN 50020, and EN 50284.

Other important guidelines

Only use new, original parts.
Do not recharge the battery in hazardous areas.
Have repairs done only by qualified personnel.
Only charge or power using the 375 Power Supply.

HAZARDOUS LOCATIONS CERTIFICATIONS (KL OPTION ONLY)

North American Certifications

Factory Mutual (FM)

Intrinsically Safe for Class I, Division 1, Groups A, B, C, and D and Class I, Zone 0, AEx ia IIC T4 (Ta = 50 °C) hazardous locations when connected as indicated in the control drawing 00375-1130. See the control drawing for input and output parameters.

Canadian Standards Association (CSA)

Intrinsically safe for use in Class 1, Zone 0, Ex ia IIC T4 hazardous locations when connected as indicated in the control drawing 00375-1130. See the control drawing for input and output parameters. Please note the parameters in the control drawing are the same as the FM parameters.

European Certifications

ATEX Intrinsic Safety

Certification No.: BVS 03 ATEX E 347 ⟨Ex⟩ II 2 G (1 GD)
EEx ia IIC T4 (-10 °C ≤ Ta ≤ +50 °C) CE 1180

HART Intrinsically Safe electrical parameters

Input Parameters	
U_i	= 30 Volt DC
I_i	= 200 mA
P_i	= 1.0 Watt
L_i	= 0
C_i	= 0
Output Parameters	
U_0	= 1.9 Volt DC
I_0	= 32 µA

FOUNDATION fieldbus

Intrinsically safe FISCO					
U_{iIIC}	= 17.5 Volt DC	I_{iIIC}	= 215 mA	P_{iIIC}	= 1.9 Watt
U_{iIIB}	= 17.5 Volt DC	I_{iIIB}	= 380 mA	P_{iIIB}	= 5.3 Watt
U_0	= 1.9 Volt DC	I_0	= 32 µA		

Intrinsically safe Non-FISCO					
U_i	= 30 Volt DC	I_i	= 380 mA	P_i	= 1.3 Watt
U_0	= 1.9 Volt DC	I_0	= 32 µA		
L_i	= 0	C_i	= 0		

CHARGER / POWER SUPPLY CERTIFICATION

Declaration of Conformity/Approvals

The 375 Field Communicator charger/power supply complies to the requirements of the relevant EU directives. The conformity assessment process has been successfully completed as per the directives listed below.

LOW VOLTAGE DIRECTIVE 73/23/EEC AMENDED BY 93/68/EEC.

EN 60950:2000

EMC DIRECTIVE 89/336/EEC AMENDED BY 91/263/EEC, 92/31/EEC, THE FOLLOWING HARMONIZED STANDARDS WERE APPLIED, IMMUNITY EN 61204-3:2000

All conformity information for this product can be accessed at www.fieldcommunicator.com/techcert.htm

LABEL DRAWINGS

Figure B-1. All 375 Field Communicators will have a similar label to the one below.

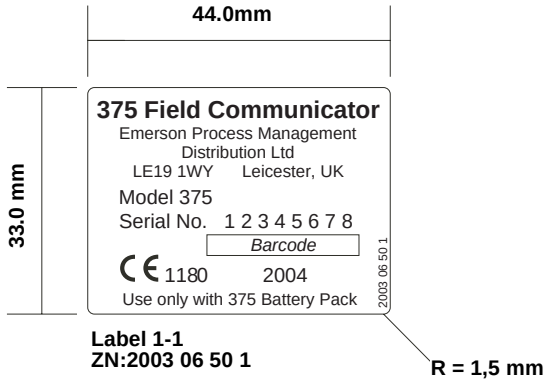
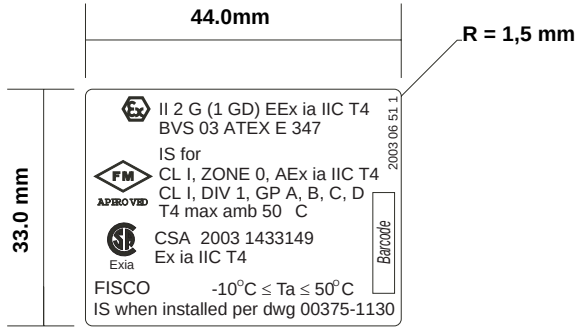
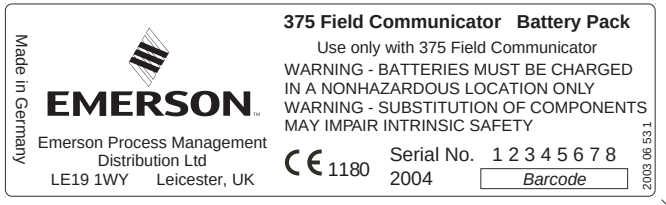


Figure B-2. Approval Ex label example (KL option only)


44.0mm
R = 1,5 mm
33.0 mm
II 2 G (1 GD) EEx ia IIC T4
BVS 03 ATEX E 347
IS for
CL I, ZONE 0, AEx ia IIC T4
CL I, DIV 1, GP A, B, C, D
T4 max amb 50 C
FM
APPROVED
CSA 2003 1433149
Ex ia IIC T4
Exia
FISCO -10°C ≤ Ta ≤ 50°C
IS when installed per dwg 00375-1130
2003 06 51 1
Barcode

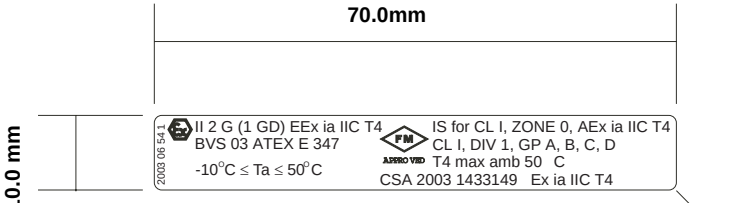
Label 1-2
ZN:2003 06 51 1

Figure B-3. Battery Pack Label example (all)



Label 4-1
ZN:2003 06 53 1

R = 1,5 mm

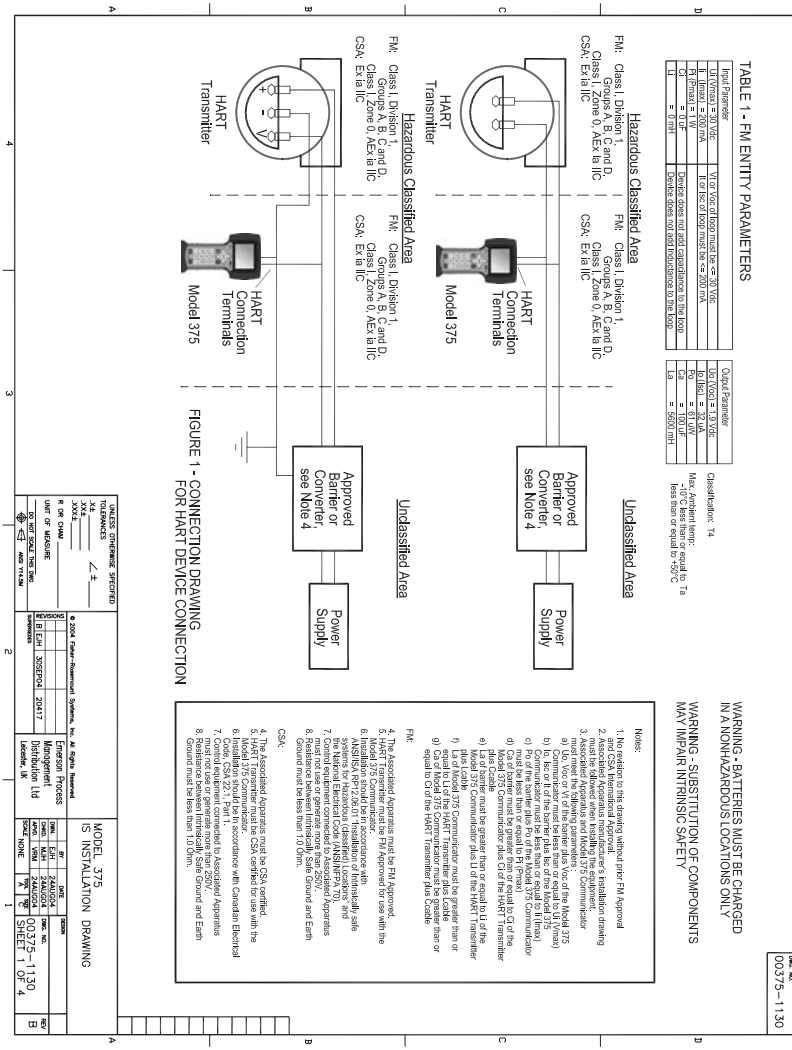

70.0mm
10.0 mm
2003 06 54 1
II 2 G (1 GD) EEx ia IIC T4
BVS 03 ATEX E 347
-10°C ≤ Ta ≤ 50°C
IS for CL I, ZONE 0, AEx ia IIC T4
CL I, DIV 1, GP A, B, C, D
T4 max amb 50 C
CSA 2003 1433149 Ex ia IIC T4

Label 4-2
ZN:2003 06 54 1

R = 1,5 mm

APPROVAL DRAWINGS

This approval drawing can also be found on the www.fieldcommunicator.com website.


DWG. NO. 00375-1130
TABLE 1 - FM ENTITY PARAMETERS
Input Parameter
Voltage (Vmax) = 30 Vdc
Current (Imax) = 200 mA
Power (Pmax) = 1 W
Ci = 0 uF
Li = 0 mH
Output Parameter
Voltage (Voc or Vt) = 9.72 Vdc
Current (Isc or It) = 32 mA
Power (Po) = 81 mW
Ca = 100 uF
La = 3600 mH
Classification: T4
Max. Ambient temp: 71°C (160°F) when Ta less than or equal to +50°C
WARNING - BATTERIES MUST BE CHARGED IN A NONHAZARDOUS LOCATIONS ONLY
WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY
Hazardous Classified Area
FM: Class I, Division 1, Groups A, B, C and D. Class I, Zone 0, AEx ia IIC
CSA: Ex ia IIC
HART Transmitter
HART Connection Terminals
Model 375
Approved Barrier or Converter, see Note 4
Unclassified Area
Power Supply
Notes:
1. No revision to this drawing without prior FM Approval and CSA International Approval.
2. Installation must be in accordance with manufacturer's installation drawing and the National Electrical Code (ANSI/NFPA 70).
3. Associator Apparatus and Model 375 Communicator must be followed when installing the equipment.
4. Approved Barrier or Converter must be FM approved with the following parameters: a) Us, Voc or Vt of the barrier plus Voc or Vt of the Model 375 Communicator must be less than or equal to Vmax. b) Ic, Isc or It of the barrier must be less than or equal to Imax. c) Communicator must be less than or equal to Li (Imax). d) Ca of barrier must be greater than or equal to Ci of the Model 375 Communicator plus Ci of the HART Transmitter plus Ccable. e) La of barrier must be greater than or equal to Li of the Model 375 Communicator plus Li of the HART Transmitter plus Lcable. f) La of Model 375 Communicator must be greater than or equal to Li of the HART Transmitter plus Lcable. g) Ca of Model 375 Communicator must be greater than or equal to Ci of the HART Transmitter plus Ccable.
FM:
4. The Associated Apparatus must be FM Approved.
5. HART Transmitter must be FM Approved for use with the Model 375 Communicator.
6. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.
CSA:
4. The Associated Apparatus must be CSA certified.
5. HART Transmitter must be CSA certified for use with the Model 375 Communicator.
6. Installation should be in accordance with Canadian Electrical Code, CSA 22.1 Part 1.
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.
FIGURE 1 - CONNECTION DRAWING FOR HART DEVICE CONNECTION
UNLESS OTHERWISE SPECIFIED TOLERANCES
X.X ± ∠ ±
.XX ±
.XXX ±
R OR DIAM
UNIT OF MEASURE
DO NOT SCALE THIS DWG
AND Y14.5M
REVISIONS
DESCRIPTION
ECN
BY
DATE
INITIAL RELEASE
3X5270H4
2DA1024
24AUG04
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Emerson Process Management
Distribution Ltd
Heathfield, East Sussex, UK
MODEL 375 IS INSTALLATION DRAWING
DWG. NO. 00375-1130
REV. B
SIZE A4
SCALE NONE
WEIGHT
SHEET 1 OF 4

DWG. NO. 00375–1130

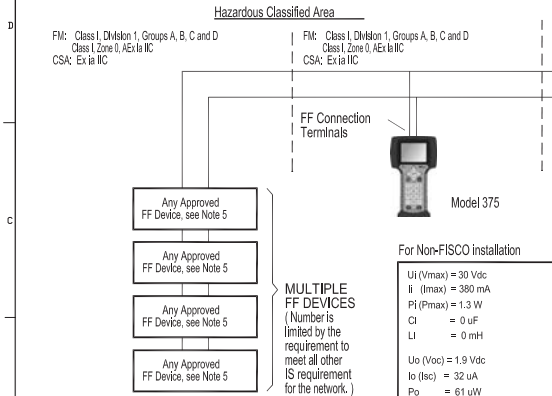
Hazardous Classified Area
FM: Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC
CSA: Ex ia IIC
FM: Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC
CSA: Ex ia IIC
Unclassified Area
Any Approved Associated Apparatus, see Note 4
FF Connection Terminals
Model 375
Any Approved FF Device, see Note 5
Any Approved FF Device, see Note 5
Any Approved FF Device, see Note 5
Any Approved FF Device, see Note 5
MULTIPLE FF DEVICES (Number is limited by the requirement to meet all other IS requirement for the network.)

FIGURE 2 - CONNECTION DRAWING FOR FF Non-FISCO DEVICE CONNECTION

For Non-FISCO installation

Ui (Vmax)	= 30 Vdc
Ii (Imax)	= 380 mA
Pi (Pmax)	= 1.3 W
Ci	= 0 uF
Li	= 0 mH
Uo (Voc)	= 1.9 Vdc
Io (Isc)	= 32 uA
Po	= 61 uW
Ca	= 100 uF
La	= 5600 mH

Leakage current: less than or equal to 50 uA

Classification: T4

Max. Ambient temp: -10°C less than or equal to Ta less than or equal to +50°C

WARNING - BATTERIES MUST BE CHARGED IN A NONHAZARDOUS LOCATIONS ONLY

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

Notes:

1. No revision to this drawing without prior FM Approval and CSA International Approval.
2. Associated Apparatus manufacturer's installation drawing must be followed when installing the equipment.
3. Associated Apparatus and Model 375 Communicator must meet the following parameters :
   a) Uo, Voc or Vt of the barrier plus Voc of the Model 375 Communicator must be less than or equal to Ui (Vmax)
   b) Io, Isc or It of the barrier plus Isc of the Model 375 Communicator must be less than or equal to Ii (Imax)
   c) Po of the barrier plus Po of the Model 375 Communicator must be less than or equal to Pi (Pmax)
   d) Ca of barrier must be greater than or equal to Ci of the Model 375 Communicator plus Ci of the HART Transmitter plus Ccable
   e) La of barrier must be greater than or equal to Li of the Model 375 Communicator plus Li of the HART Transmitter plus Lcable
   f) La of Model 375 Communicator must be greater than or equal to Li of the HART Transmitter plus Lcable
   g) Ca of Model 375 Communicator must be greater than or equal to Ci of the HART Transmitter plus Ccable

FM:

4. The Associated Apparatus must be FM Approved.
5. FF Device must be FM Approved for use with the Model 375 Communicator.
6. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

CSA:

4. The Associated Apparatus must be CSA certified.
5. FF Device must be CSA certified for use with the Model 375 Communicator.
6. Installation should be in accordance with Canadian Electrical Code, CSA 22.1, Part 1.
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1.0 Ohm.

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X± .XX± .XXX± ∠±
R OR CHAM
UNIT OF MEASURE
DO NOT SCALE THIS DWG
ANSI Y14.5M

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REVISIONS				
B	EJH	30SEP04	20417	
SUPERSEDES				

Emerson Process Management Distribution Ltd Leicester, UK

MODEL 375 IS INSTALLATION DRAWING

	BY	DATE
DWN.	EJH	24AUG04
CHKD.	MJH	24AUG04
APVD.	VRM	24AUG04

DESIGN

DWG. NO. 00375–1130 REV B

SCALE NONE TOL. A ± SIZE C

SHEET 2 OF 4

DWG. NO. 00375–1130

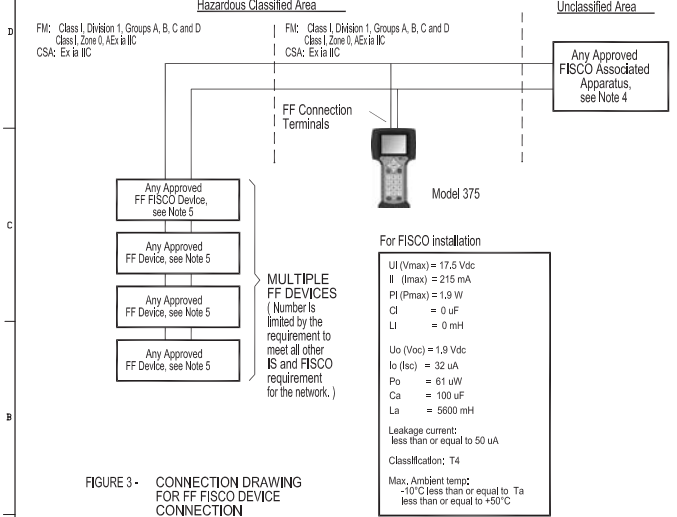
Hazardous Classified Area
FM: Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC
CSA: Ex ia IIC
FM: Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC
CSA: Ex ia IIC
Unclassified Area
Any Approved FISCO Associated Apparatus, see Note 4
FF Connection Terminals
Model 375
Any Approved FF FISCO Device, see Note 5
Any Approved FF Device, see Note 5
Any Approved FF Device, see Note 5
Any Approved FF Device, see Note 5
MULTIPLE FF DEVICES (Number Is limited by the requirement to meet all other IS and FISCO requirement for the network.)

FIGURE 3 - CONNECTION DRAWING FOR FF FISCO DEVICE CONNECTION

For FISCO installation

Ui (Vmax) = 17.5 Vdc
Ii (Imax) = 215 mA
Pi (Pmax) = 1,9 W
Ci = 0 uF
Li = 0 mH

Uo (Voc) = 1,9 Vdc
Io (Isc) = 32 uA
Po = 61 uW
Ca = 100 uF
La = 5600 mH

Leakage current:
less than or equal to 50 uA

Classification: T4

Max. Ambient temp:
-10°C less than or equal to Ta
less than or equal to +50°C

WARNING - BATTERIES MUST BE CHARGED IN A NONHAZARDOUS LOCATIONS ONLY

WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

Notes:

1. No revision to this drawing without prior FM Approval and CSA International Approval.
2. Associated Apparatus manufacturer's installation drawing must be followed when installing the equipment.

3. Associated Apparatus and Model 375 Communicator must meet the conditions of the

"FISCO CONCEPT"

see notes on Page 4

FM:

4. The Associated Apparatus must be FM Approved.
5. FF Device must be FM Approved for use with the Model 375 Communicator.
6. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically safe systems for Hazardous (classified) Locations" and the National Electrical Code (ANSI/NFPA 70).
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1,0 Ohm.

CSA:

4. The Associated Apparatus must be CSA certified.
5. FF Device must be CSA certified for use with the Model 375 Communicator.
6. Installation should be in accordance with Canadian Electrical Code, CSA 22.1, Part 1.
7. Control equipment connected to Associated Apparatus must not use or generate more than 250V.
8. Resistance between Intrinsically Safe Ground and Earth Ground must be less than 1,0 Ohm.

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X± _____ ∠ ±____
.XX± _____
.XXX± _____
R OR CHAM _____
UNIT OF MEASURE _____
DO NOT SCALE THIS DWG
ANSI Y14.5M

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REVISED				
B	EJH	30SEP04	20417	

SUPERSEDES

Emerson Process Management
Distribution Ltd
Leicester, UK

MODEL 375
IS INSTALLATION DRAWING

	BY	DATE
DWN.	EJH	24AUG04
CHKD.	MJH	24AUG04
APVD.	VRM	24AUG04

DESIGN

DWG. NO. 00375–1130 SHEET 3 OF 4

REV B

SCALE NONE

SIZE A C

DWG. NO. 00375-1130

FISCO CONCEPT

THE FISCO CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS TO ASSOCIATED APPARATUS NOT SPECIALLY EXAMINED IN SUCH COMBINATION. THE CRITERIA FOR INTERCONNECTION IS THAT THE VOLTAGE (Ui OR Vmax), THE CURRENT (Ii OR Imax) AND THE POWER (Pi OR Pmax) WHICH AN INTRINSICALLY SAFE APPARATUS CAN RECEIVE AND REMAIN INTRINSICALLY SAFE CONSIDERING FAULTS, MUST BE EQUAL OR GREATER THAN VOLTAGE (Uo, Voc OR Vt), THE CURRENT (Io, Isc OR It) AND THE POWER (Po OR Pmax) LEVELS WHICH CAN BE DELIVERED BY THE ASSOCIATED APPARATUS, CONSIDERING FAULTS AND APPLICABLE FACTORS. IN ADDITION, THE MAXIMUM UNPROTECTED CAPACITANCE (Ci) AND THE INDUCTANCE (Li) OF EACH APPARATUS (OTHER THAN THE TERMINATION) CONNECTED TO THE FIELDBUS MUST BE LESS THAN OR EQUAL TO 5 nF and 10 uH RESPECTIVELY.

IN EACH SEGMENT ONLY ONE ACTIVE DEVICE, NORMALLY THE ASSOCIATED APPARATUS, IS ALLOWED TO PROVIDE THE NECESSARY ENERGY FOR THE FIELDBUS SYSTEM. THE VOLTAGE Uo (OR Voc OR Vt) OF THE ASSOCIATED APPARATUS IS LIMITED TO A RANGE OF 14 V TO 24 Vdc ALL OTHER EQUIPMENT CONNECTED TO THE BUS CABLE HAS TO BE PASSIVE, MEANING THAT THEY ARE NOT ALLOWED TO PROVIDE ENERGY TO THE SYSTEM, EXCEPT A LEAKAGE CURRENT OF 50uA FOR EACH CONNECTED DEVICE. SEPARATELY POWERED EQUIPMENT NEEDS GALVANIC ISOLATION TO ASSURE THAT THE INTRINSICALLY SAFE FIELDBUS CIRCUIT REMAINS PASSIVE.

THE CABLE USED TO INTERCONNECT DEVICES NEEDS TO HAVE THE PARAMETERS IN THE FOLLOWING RANGE:

Loop Resistance R:	15.....150 Ohm/km
Inductance per unit length L:	0.4.....1 mH/km
Capacitance per unit length C:	80.....200 nF
C = C line/line + 0.5C line/screen, if both lines are floating, or	
C = C line/line + C line/screen, if the screen is connected to one line	
Length of trunk cable:	less than or equal to 1000m
Length of spur cable:	less than or equal to 30m
Length of spur splice:	less than or equal to 1m

AT EACH END OF THE TRUNK CABLE AN APPROVED INFALLIBLE LINE TERMINATION WITH THE FOLLOWING PARAMETERS IS SUITABLE:

R = 90.....100 Ohm C = 0.....2.2 uF

ONE OF THE ALLOWED TERMINATIONS MIGHT ALREADY BE INTEGRATED IN THE ASSOCIATED APPARATUS. THE NUMBER OF PASSIVE APPARATUS CONNECTED TO THE BUS SEGMENT IS NOT LIMITED DUE TO I.S. REASONS. IF THE ABOVE RULES ARE RESPECTED, UP TO A TOTAL LENGTH OF 1000 m (SUM OF TRUNK AND ALL SPUR CABLES) OF CABLE IS PERMITED. THE INDUCTANCE AND THE CAPACITANCE OF THE CABLE WILL NOT IMPAIR THE INTRINSIC SAFETY OF THE INSTALLATION.

UNLESS OTHERWISE SPECIFIED TOLERANCES
.X±_____ ∠±_____
.XX±_____
.XXX±_____
R OR CHAM _____
UNIT OF MEASURE
DO NOT SCALE THIS DWG
ANSI Y14.5M

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REVISIONS				
B	EJH	30SEP04	20417	

SUPERSEDES

Emerson Process Management
Distribution Ltd
Leicester, UK

MODEL 375
IS INSTALLATION DRAWING

	BY	DATE
DWN.	EJH	24AUG04
CHKD.	MJH	24AUG04
APVD.	VRM	24AUG04

DESIGN
DWG. NO. 00375-1130
REV B
SCALE NONE
TOOL A
SIZE C
SHEET 4 OF 4

APPENDIX C GRAPHICS INFORMATION

OVERVIEW

The Graphics functionality enables a new, sleek user interface design by using enhanced Electronic Device Description Language (EDDL) capabilities. You can now view HART or fieldbus device information as images, charts, and graphs.

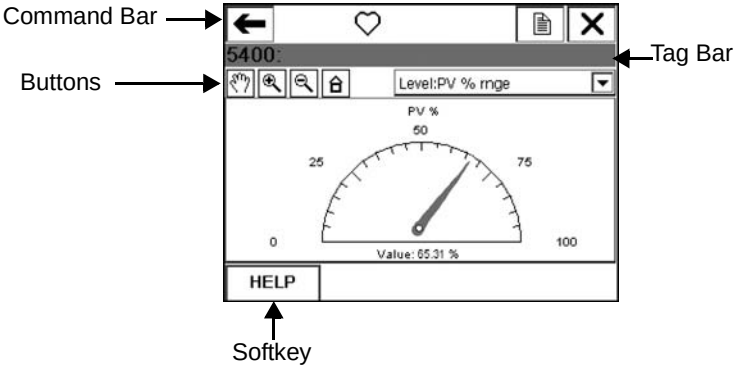
To view the graphical representations, you need a device with enhanced EDDL, 375 system software version 2.0, and a 375 Field Communicator with a Graphics license, which can be enabled in your 375 Field Communicator from the Easy Upgrade Programming Utility. See the Easy Upgrade Programming Utility online Help for more information.

The following sections provide details on the screen layout, the buttons used to modify the graphics, and the graphics options.

SCREEN LAYOUT

A 375 Field Communicator has four elements on a screen. The Command Bar is a row of icons on the top of the screen. The Tag Bar displays the device type and device tag of the connected device. The buttons let you modify the appearance of a screen by panning, zooming, or resetting the screen. The **HELP** Softkey lets you view information about the graphics displayed on the screen.

Figure C-1. 375 Field Communicator screen layout



BUTTONS

Use the following buttons to modify the appearance of the graphs and charts on your screen:

Pan - Tap this button, select a point in the chart, and drag to move the chart back and forth in the window.

Area zoom - Tap this button, then tap and drag a point in the chart to create an enlarged box. Once you release your stylus from the window, the chart enlarges to fit the area. This control is available on strip charts and graphs only.

Zoom in - Tap this button to zoom in at a fixed rate from the center of the chart. Tap again to repeat the action.

Zoom out - Tap this button to zoom out at a fixed rate from the center of the chart. Tap again to repeat the action.

Reset - Tap this button to return the chart to its original home view, removing any panning or zooming you may have performed.

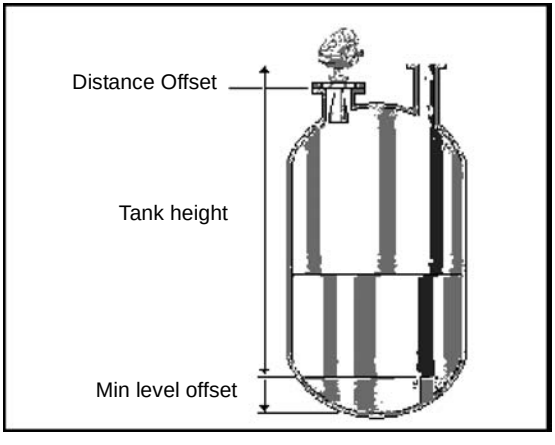
Drop-down menu - Tap this menu to select between different variables to highlight on the chart.

GRAPHICS OPTIONS

Images

An image is a full screen display of a device. Images can include logos and various graphics, such as tanks. To view the image, select the image label in the menu. The full screen image is shown. To return to the menu view, press any key or tap the touch screen.

Figure C-2. Image example



Charts

Charts allow the device descriptions to display a graphic view of variables as they occur over time. There are four major types of charts:

- Strip/sweep/scope - Displays variable data with an x-axis of time.

  A strip chart continually updates the chart, scrolling from right to left.

  A scope/sweep chart paints the screen from left to right, and then paints the screen from left to right again, overwriting the oldest data.

- Horizontal bar - Displays data represented as bars from left to right.
- Vertical bar - Displays data represented as bars from bottom to top.
- Gauge - Displays a gauge chart, similar to an analog car speedometer.

NOTE

If a chart is displayed for an extended time period, the 375 Field Communicator will have decreased response time due to the large number of data points in the chart.

Strip/sweep/scope charts

The strip/sweep/scope chart formats device data into a line chart that displays device data over time. The command bar shows the back arrow icon, HART heartbeat or fieldbus logo, LAS indicator (fieldbus devices only), ScratchPad application icon, and terminate icon. The tag bar shows the device type and device tag. The values, labels, and axis displayed are determined by the device manufacturer.

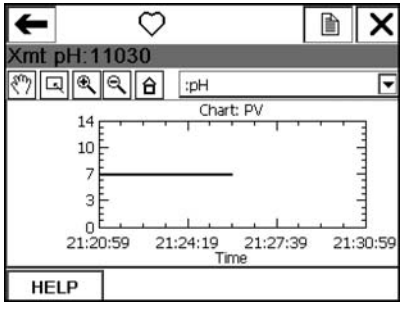
The **HELP** softkey appears if there is help associated with the particular selection. Use the buttons to pan, zoom, and reset the chart. Use the left arrow button on the 375 Field Communicator or the back arrow icon on the screen to close the chart view and return to the previous menu.

Use the drop-down menu to select the variable you want to display. The selected variable is the darkest line in the chart. Other variables that share the same source or same axis appear in a lighter shade of grey on the chart. Variables that do not share the same axis appear with a dashed line.

The time shown on the x-axis starts at the time the chart starts. The default value for time is 10 minutes.

The chart update rate is determined by the device manufacturer. The default chart update rate is 1 second.

Figure C-3. Strip/Sweep/Scope chart example



Horizontal bar charts

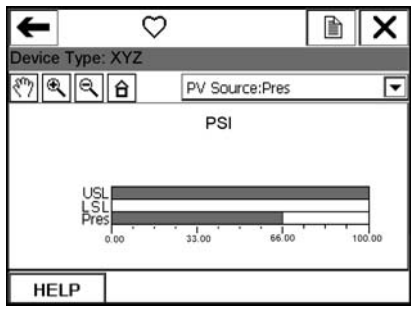
A horizontal bar chart formats device data into bars from left to right and varies with time. The command bar shows the back arrow icon, HART heartbeat or fieldbus logo, LAS indicator (fieldbus devices only), ScratchPad application icon, and terminate icon. The tag bar shows the device type and device tag.

The **HELP** softkey appears if there is help associated with the particular selection. Use the buttons to pan, zoom, and reset the chart. Use the left arrow button on the 375 Field Communicator or the back arrow icon on the screen to close the chart view and return to the previous menu.

Use the drop-down menu to select the variable you want to display. Additional horizontal bars may be present if more than one variable shares the same axis as the selected variable. The selected variable from the drop-down menu appears dark while the other variables appear light grey. The values, labels, and axis displayed are determined by the device manufacturer.

The chart update rate is determined by the device manufacturer. The default chart update rate is 1 second.

Figure C-4. Horizontal bar chart example



Vertical bar charts

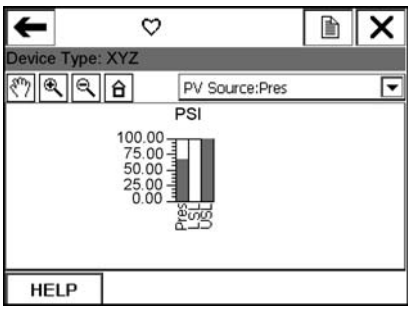
A vertical bar chart formats device data into bars from bottom to top and varies with time. The command bar shows the back arrow icon, HART heartbeat or fieldbus logo, LAS indicator (fieldbus devices only), ScratchPad application icon, and terminate icon. The tag bar shows the device type and device tag.

The **HELP** softkey appears if there is help associated with the particular selection. Use the buttons to pan, zoom, and reset the chart. Use the left arrow button on the 375 Field Communicator or the back arrow icon on the screen to close the chart view and return to the previous menu.

Use the drop-down menu to select the variable you want to display. Additional vertical bars may be present if more than one variable shares the same axis as the selected variable. The selected variable from the drop-down menu appears dark while the other variables appear light grey. The values, labels, and axis displayed are determined by the device manufacturer.

The chart update rate is determined by the device manufacturer. The default chart update rate is 1 second.

Figure C-5. Vertical bar chart example



Gauge charts

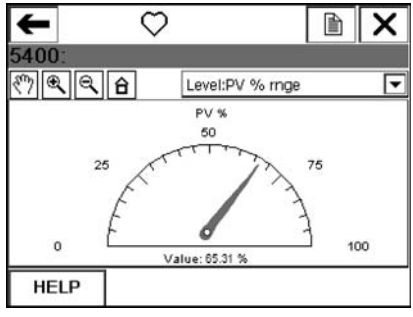
A gauge chart formats device data into a view similar to an analog car speedometer and plots device data varying with time. The command bar shows the back arrow icon, HART heartbeat or fieldbus logo, LAS indicator (fieldbus devices only), ScratchPad application icon, and terminate icon.The tag bar shows the device type and device tag.

The **HELP** softkey appears if there is help associated with the particular selection. Use the buttons to pan, zoom, and reset the chart. Use the left arrow button on the 375 Field Communicator or the back arrow icon on the screen to close the chart view and return to the previous menu.

Use the drop-down menu to select the variable you want to display. Additional gauge needles may be present if more than one variable shares the same axis as the selected variable. The selected variable from the drop-down menu appears as a long, dark needle while the other variables appear as short, light grey needles. There can only be a maximum number of three variables per gauge chart. The values, labels, and axis displayed are determined by the device manufacturer.

The chart update rate is determined by the device manufacturer. The default chart update rate is 1 second.

Figure C-6. Gauge chart example



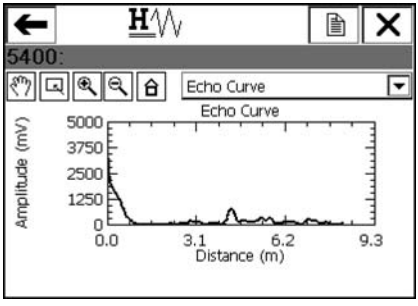
Graphs

A graph is a snapshot line drawing of device information. The command bar shows the back arrow icon, HART heartbeat or fieldbus logo, LAS indicator (fieldbus devices only), ScratchPad application icon, and terminate icon. The tag bar shows the device type and device tag.

The **HELP** softkey appears if there is help associated with the particular selection. Use the buttons to pan, zoom, and reset the graph. Use the left arrow button on the 375 Field Communicator or the back arrow icon on the screen to close the view and return to the previous menu.

Use the drop-down menu to select the plot you want to display. Additional plots may be present if more than one plot shares the same axis as the selected variable. The selected plot from the drop-down menu appears dark while the other plots appear light grey. Variables that do not share the same axis appear with a dashed line. The values, labels, and axis displayed are determined by the device manufacturer.

Figure C-7. Graph example



GLOSSARY

Alphanumeric

A character set that contains both letters and digits and, usually, other characters, such as punctuation marks.

AMS Suite: Intelligent Device Manager

Software for remotely managing Smart field devices (offline or online) over existing HART or FOUNDATION fieldbus networks. You can use AMS Device Manager to monitor devices, configure devices, maintain calibration results, run diagnostic routines, and maintain historical data.

Burst Mode

A communication mode in a HART transmitter to send data at regular intervals.

Card Reader

A USB device that is capable of reading the 375 System Card, which is located under the battery pack in the 375 Field Communicator. You can use a card reader to transfer system software and device descriptions to a 375 from the Easy Upgrade Programming Utility.

CDC

Communication and Diagnostic Circuitry

Data Link Time

Data Link Time is a network-wide time periodically distributed by the LAS to synchronize all device clocks on the bus.

Device Configuration

Parameters that define the physical attributes and operating characteristics of a device. It does not include dynamic data.

Device Description (DD)

A set of instructions written in the HART or FOUNDATION fieldbus Device Description Language that defines the parameters, commands, and methods that a host application uses to communicate with a HART or FOUNDATION fieldbus field device.

DDL

Device Description Language. A specialized programming language used to write device descriptions for HART or FOUNDATION fieldbus-compatible field devices. *See also* Device Description.

Easy Upgrade option

An upgrade option to the 375 Field Communicator System Card. It lets you update the 375 system software and DDs using the Easy Upgrade Programming Utility. It also lets you select and enable new licenses to add new functionality in your 375. This option can be purchased from your local 375 sales representative.

EDDL

Enhanced Electronic Device Description Language. Recent enhancements to the EDDL language enable device information to be displayed as images, charts, and graphs.

Event capture file

An ASCII file (.rec file) that captures the user keystrokes, display screens, and protocol communication messages on a 375 Field Communicator and can be played back. Event capture files can be useful in diagnosing problems. To create event capture files on a 375, you must turn on the Event Capture function from the Settings menu.

Expansion Module (EM)

An optional removable memory card that snaps into the Expansion Port on the side of the 375 Field Communicator. See the ordering information for availability types.

Field device

Field devices may generate or receive an analog signal in addition to the HART digital communication signal.

Fieldbus Foundation

The organization that develops and supports FOUNDATION fieldbus, an international, interoperable standard for communication of process automation and control information. Members include suppliers and end users of process control and manufacturing automation products. Support for the standard includes education, interoperability and conformance testing, testing tools, and development software.

FOUNDATION fieldbus

A specific fieldbus technology developed and supported by Emerson Process Management and the other members of the independent Fieldbus Foundation. FOUNDATION fieldbus technology uses device descriptions and function blocks to enable intelligent field devices to execute control functions traditionally performed by a distributed control system.

Graphics

A feature that enables the 375 Field Communicator to display device information as images, charts, and graphs. The Graphics feature utilizes enhanced Electronic Device Description Language, EDDL. To view the graphical representations, you need a device with enhanced EDDL, a 375 Field Communicator with a Graphics license, and the 375 system software version 2.0. If the 375 Field Communicator does not have a Graphics license, enhanced DDs can still be used. However, the graphical representations will not be displayed.

HART device

A device that communicates information using the HART protocol.

HART loop

A communication network in which the master and slave device are HART-smart or HART-compatible.

HART protocol

Highway Addressable Remote Transducer communication protocol. An industry-standard protocol for digitally enhanced 4-20 mA communication with Smart field devices.

HART tag

An 8-character field used to identify a device. A 32-character long tag is also possible with HART Universal revision 6 device. This field is stored in the HART device and can be modified.

Instantiation

Some FOUNDATION fieldbus devices support instantiation of function or transducer blocks in the device. This means the device allows a command to be sent to it that will create or instantiate additional function or transducer blocks in the device. Once instantiated, these blocks operate like any other block in the device. The 375 Field Communicator supports the commands to instantiate and to delete function and transducer blocks in a fieldbus device.

Internal Flash

Non-volatile memory that stores the operating system, application software, internal device configurations, event captures, fieldbus statistics, and user generated text files.

Intrinsic Safety

Circuits that are designed to limit the amount of energy consumed or provided to field devices to levels below those that are required to ignite specific types of hazardous materials under fault and no fault conditions.

Also a method of providing safe operation of electronic process-control instrumentation in hazardous areas, such as flammable environments. IS systems keep the available electrical energy in the system low enough that ignition of the hazardous atmosphere cannot occur.

Intrinsic Safety barrier

A physical entity that limits the current and voltage into a hazardous area in order to satisfy Intrinsic Safety requirements.

IrDA

Infrared Data Association, a non-profit trade association that establishes standards for infrared communications between devices such as personal computers, printers, and handheld devices.

Link Active Scheduler (LAS)

The bus arbiter for the segment. The LAS recognizes and adds new devices to the link, removes non-responsive devices from the link, and distributes Data Link (DL) and Link Scheduling (LS) time on the link.

Link Master

A Link Master device controls when devices access the fieldbus and executes the link schedule, which synchronizes communications with function block execution on the fieldbus. The H1 card or any field device that supports Link Master functionality can function as a Link Master device. Only one Link Master device can be active at a time on the fieldbus segment. This device is called the LAS.

Link Scheduling time

Link Scheduling time is a link-specific time represented as an offset from Data Link Time. It is used to indicate when the LAS on each link begins and repeats its schedule. System management uses it to synchronize function block execution with the data transfers scheduled by the LAS.

Online Licensing

A feature in the Easy Upgrade Programming Utility to select and download new licenses that enable additional functionality in the 375 Field Communicator. You can order and download licenses for the FOUNDATION fieldbus application, Easy Upgrade option, and the Graphics option. The 375 Field Communicator must be licensed for the Easy Upgrade option before you can download licenses for the FOUNDATION fieldbus application or the Graphics functionality. See the Easy Upgrade Programming Utility online Help for more information.

Personal Computer (PC)

Synonymous with microcomputer, a computer that serves one user in the office or the home. PCs are the largest installed base of personal computers.

Polling

A method of sequentially interrogating a network to determine which devices are present.

Process variable (PV)

A process parameter that is being measured or controlled (e.g., level, flow, temperature, mass, or density).

Segment (Fieldbus only)

The section of a fieldbus that is terminated in its characteristic impedance. Segments are linked by repeaters to form a complete Fieldbus.

Shout/deaf mode

A communication mode in the 375 Field Communicator where the amplitude of the 375 signal is increased. The 375 Field Communicator determines when to enter this mode.

Stand By

A power option that turns off the screen display and parts of the 375 Field Communicator. Use this feature to save battery life or to reduce the boot-up time. The green, slowly flashing multifunction LED indicates the 375 Field Communicator is in stand by mode.

System Card (SC)

An internal Secure Digital Card with non-volatile Flash memory. A copy of installable 375 Field Communicator application software exists on every SC. The SC memory also stores all HART and FOUNDATION fieldbus device descriptions.

System Card Serial Number (S/N)

The serial number assigned by the manufacturer to a Secure Digital (SD) card. The System Card Serial Number uniquely identifies a 375 Field Communicator System Card.

User Configuration

A configuration that is created offline or that is transferred to a 375 Field Communicator from another program. Editing a device configuration within the 375 Field Communicator will change it to a user configuration.

User data file

A text (.TXT) file created by a user either on a PC or with the ScratchPad application on the 375 Field Communicator. User data files can be transferred between the Easy Upgrade Programming Utility and a 375.

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